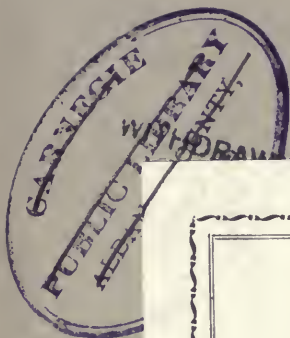


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The American City Magazine

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January-June, 1924

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FOR ADDITIONAL INFORMATION

on the subjects listed in the foregoing pages and on other subjects relating to municipal improvements and civic advance, see THE AMERICAN CITY'S new year book, THE MUNICIPAL INDEX. The 1924 edition is a bound volume of 408 pages, containing more than 148,000 words of text matter (exclusive of 261 pages of abridged catalogs) under seventeen main subject classifications. There are also more than 9,500 words descriptive of the activities and services of 114 national organizations and 25 Government bureaus serving municipalities. The bibliographies contain more than 1,100 entries; the alphabetical list of subjects, 675 entries; and the classified list of products and services, 943 entries under 375 headings.

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Tax-exempt Securities, Tax Burdens, and "Municipal Extravagance"

SHALL an attempt be made to remove "a continual stimulant to municipal extravagance" by an amendment to the Constitution of the United States abolishing the right to issue tax-exempt securities? Such a suggestion was advanced by President Coolidge in his first message to Congress, last month. With characteristic economy of words, the President states the case thus:

"Another reform which is urgent in our fiscal system is the abolition of the right to issue tax-exempt securities. The existing system not only permits a large amount of the wealth of the nation to escape its just burden, but acts as a continual stimulant to municipal extravagance. This should be prohibited by constitutional amendment. All the wealth of the nation ought to contribute its fair share to the expenses of the nation."

That many persons of wealth, with large "unearned" incomes from tax-exempt bonds, have been able to reduce their tax payments below those of other persons having smaller but taxable incomes, is a fact of common knowledge. But when attempting to correct one injustice, let us be sure that we do not create a still greater injustice and handicap to progress elsewhere. Three phases of the problem merit special consideration:

(1) If in the opinion of fiscal experts and of the Congress of the United States the burdens of the Federal income tax can be more equitably distributed by ceasing to issue tax-exempt securities of the United States, such a reform requires no constitutional amendment. The real question at issue, therefore, is whether to tax the se-

curities of state and local governments for national purposes would be in the public interest.

(2) The proposed constitutional amendment would not affect securities already issued; and if approved by Congress there would be ample time, in the process of ratification by the state legislatures, for the purchase of long-time issues of tax-free bonds by persons desiring to defeat the primary purpose of the suggested amendment. Such persons would win a substantial bonus, too, in the increased market value of their holdings in tax-free securities which would inevitably result from making all future issues subject to tax.

(3) But how about the justice of the proposal to the states and municipalities? It cannot be doubted that, if the amendment were adopted, local governments would have to pay higher interest rates on future bond issues than if the present tax-exemption privileges were continued. In other words, the taxpayers of a growing city or of a sparsely settled state would be penalized for being progressive, and for such progress would be required to contribute to the expenses of the Federal Government, not out of income or profits—on which income taxes are assumed to be based—but out of added taxes.*

Study of a complicated problem is often helped by a simple illustration. Assume a growing village in which a bond issue for

*There would be an exception, of course, in the case of revenue-producing public utilities and services—the bonds for which, we believe, might well be placed on a parity as to taxation with those of private corporations rendering similar services.

a new high school building is being considered. Under present conditions three things will happen: (a) the least progressive element will oppose any building whatever; (b) another group will favor a structure scarcely large enough for present needs, and without such "frills" as a modern assembly hall or playground; and (c) the most progressive will wish to vote bonds for a building and site conforming to modern ideas and adequate for at least a few years to come. As to whether the public interest would best be served by the victory of group a, b or c is a problem for the voters of that particular village to determine. But can it be doubted that educational needs will be met more fully with money available at about $4\frac{1}{2}$ to 5 per cent than if necessary to pay $5\frac{1}{2}$ to 6 per cent because of Federal taxes?

The average voter cannot have the intimate knowledge of the needs of the National Government necessary to determine where wastes and extravagances can be lessened by wise economy; he must leave that problem to the authorities at Washington. And is it not equally true that the authorities at Washington cannot have the knowledge of local conditions necessary to determine the needs of states and their subdivisions and of the wisdom of the wide variety of conveniences and services which the modern municipality performs for its people? Is not *that* problem one which must be left to the local officials and voters for wise decision, under the restrictions as to debt limits* imposed by their respective state governments? Is not the idea of the framers of the Constitution still sound, that the states ought to be left free to use their own credit for their own development without Federal interference?

In another section of the very message in which President Coolidge scores tax-exempt bonds as a stimulus to municipal extravagance, he refers to the "appalling figures of illiteracy, representing a condition which does not vary much in all parts of the Union" and to the fact that "education is peculiarly a local problem." The President also advocates continued highway building as a necessary public improvement, adding that "no expenditure of public money contributes so much to the national wealth as for building good roads." But do the ad-

vocates of taxing municipal bonds stop to consider how large a percentage of the total issues are for the building of schools and highways? The report of the Bureau of the Census on "Financial Statistics of Cities" for 1921—figures for 1922 being not yet available—shows that the payments for outlays* that year of the 183 cities reporting, were divided as follows:

Highways	\$124,480,935
Public service enterprises	66,254,112
Schools	55,396,376
Sanitation or promotion of cleanliness	34,742,791
Recreation	14,409,437
Protection to person and property	8,814,788
Charities, hospitals and corrections	6,120,062
General government	3,230,701
Libraries	1,577,931
Conservation of health	1,419,612
Miscellaneous	1,282,457
Total	\$317,729,202

An estimate of the total annual volume of bonds issued by the states and their subdivisions during the last seven years will be found on page 91 of this issue.

Secretary Mellon has voiced an oft-repeated argument for abolishing tax-exempt securities by stating that "funds badly needed for productive purposes are diverted into unproductive and frequently wasteful public expenditures." When it is remembered that the "productive purposes" of industry include such essentials as cosmetics, jewelry, chewing gum, and yachts, can it be doubted that on the average the capital outlays of municipalities confer as great benefits on society for each dollar expended as the capital outlays of industry? Perhaps the investment of municipal bonds in parks and playgrounds would be regarded by many as among the "unproductive" expenditures of public funds; but shall it be said that the vastly greater outlay for commercialized amusements by "productive industry" is, dollar for dollar, an expenditure of greater public benefit?

When the Sixteenth Amendment was in

*As defined by the Census Bureau, payments for outlays comprise "amounts paid by the several cities for the acquisition and construction of more or less permanent properties and public improvements." About 80 per cent of the amounts thus reported for 1921 were financed by increase in debt. For the same 183 cities the revenue receipts from taxes, special assessments, etc., for the year—exclusive of bond issues—were \$1,279,918,791. It will thus be seen that the expenditures from current revenues were four times as great as from loans. The unsound practise, heretofore more or less prevalent, of paying current expenses out of loans, or of financing short-lived improvements by long-time bonds, is rapidly becoming a thing of the past.

THE AMERICAN CITY favors, of course, the pay-as-you-go plan of financing public improvements wherever local conditions make it feasible. See, for example, the article on page 35 of this issue.

* See article on page 58 of this issue.

process of ratification by the state legislatures, Secretary Hughes was Governor of New York. Interpreting the phrase in this amendment which gives to Congress the "power to lay and collect taxes on incomes from whatever source derived"* as a proposal to authorize Federal taxation of in-

*In reply to an inquiry as to the present interpretation of the Sixteenth Amendment in relation to tax-exempt securities, THE AMERICAN CITY has received the following statement from the Under-Secretary of the Treasury, dated December 15, 1923:

"The basis for the exemption of income received from securities issued by states, municipalities and local subdivisions is the principle of constitutional law that the Government of the United States is one of delegated powers, and that the taxing power of the Federal Government is limited so that it cannot interfere with the reserved powers of the state governments. This principle has often been affirmed by the Supreme Court of the United States, notably in the case of *Pollock v. Farmers Loan and Trust Co.*, 157 U. S. 429, 585, 601, 652, 653, in which it was held—the full court agreeing on this point—that Congress was without power to impose such a tax in respect of interest received from bonds issued by a

state or any of its counties or municipalities. This decision was made before the adoption of the 16th Amendment, but it has been held in the case of *Evans v. Gore*, 253 U. S. 245, that the language "from whatever source derived" contained in the amendment does not extend the Federal taxing power, except to remove all requirement of apportionment in connection with income tax."

"To permit such securities to be the subject of Federal taxation is to place such limitations upon the borrowing power of the state as to make the performance of the functions of local government a matter of Federal grace."

As to the attitude of the now Secretary of State on the tax-exemption question, we are not informed, but Mr. Hughes' opinion of the danger of Federal domination in local affairs, as expressed in 1910, is worthy, we are sure, of most serious consideration in the present attempt to solve the problem of equitable taxation for Federal purposes.

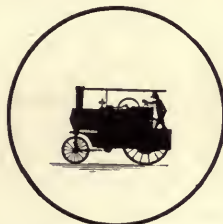
state or any of its counties or municipalities. This decision was made before the adoption of the 16th Amendment, but it has been held in the case of *Evans v. Gore*, 253 U. S. 245, that the language "from whatever source derived" contained in the amendment does not extend the Federal taxing power, except to remove all requirement of apportionment in connection with income tax."

Preparing the City's Annual Report

IN municipalities whose fiscal year corresponds with the calendar year, many an official will be struggling during the month of January with the preparation of an annual report. To such, this article attempts to offer suggestions of practical value.

Before rushing into type, common sense demands a few minutes of calm consideration as to what the thing is all about. Why is an annual report, anyway? Too often in the past municipal officials have appeared to assume that this yearly document is a necessary evil, decreed by law or custom, to serve as a repository of accounting statistics and historical data which no one will ever voluntarily read and which few will wish to consult. But a different point of view is gaining headway—that the annual report of a municipality can be made a

HOW BLUEFIELD'S TAX DOLLAR WAS SPENT DURING THE YEAR ENDING JUNE 30, 1923



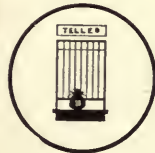
STREET PAVING & REPAIRING
32¢



FIRE PROTECTION
12¢



POLICE
10¢



INTEREST & SINKING FUND
10¢



ADMINISTRATION
9½¢



SEWERS
7¢



STREET CLEANING
6¢



HEALTH & WELFARE
5¢



STREET LIGHTING
3¢



GARBAGE COLLECTION
2¢



CHARITY & CONTINGENT
1½¢



LIBRARY
1½¢



PLAY GROUNDS
½¢

GRAPHIC ANALYSIS FROM THE BLUEFIELD REPORT
Public school taxes are assessed separately

means of transmitting to the voters an interesting and intelligent picture of their city government in action. To accomplish this result, four factors are of special importance:

1. *Promptness of Publication.*—In these days of the news reel and the radio, scant attention will be given by the average citizen to an annual report for the year ended December 31, 1923, if not published until next summer or fall. If issued in January or February, the appeal of timeliness is not lost.

2. *Pictures and Graphs.*—If you read THE AMERICAN CITY with greater interest than you would an unillustrated magazine, would not your annual report be made more readable by a liberal supply of half-tone cuts or charts?

3. *Economy of Words.*—Your fellow citizens are busy—or think they are—and your story of the year's work, if a voluminous document, will usually be put aside for that more convenient season which never comes.

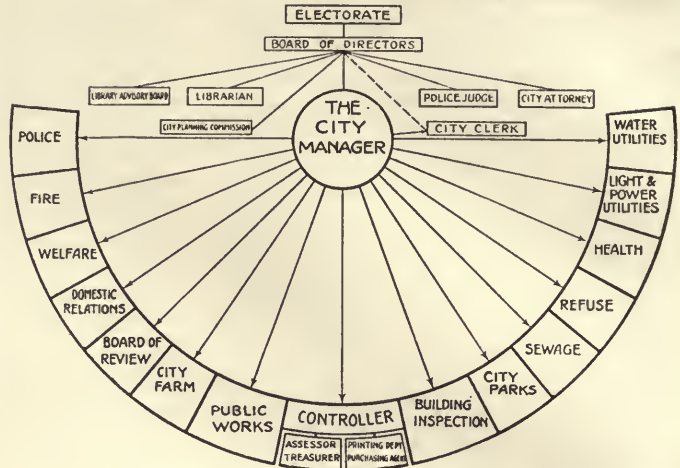
4. *Few Statistics.*—If yours is a city of small or medium size and your charter or ordinance compels the publication of every item of income and expenditure, better get the law changed. A few totals and high lights are all the average citizen will read—but make it clear that any one interested in the details may consult them at the City Hall.

Analysis of Reports of City Manager Cities

The reports of twelve typical city manager municipalities for the last fiscal year have been selected for brief analysis. These cities range in size from Excelsior Springs, Mo., with a 1920 population of 4,165, to Wichita, Kans., with 72,217. The size and number of pages and number of illustrations in each report are as follows:

City and State	Size of Page	No. of Pages (Plus Cover)	No. of Half-Tones	Other Illustrations
Alliance, Nebr.	7 x 10 1/4	48	10	12
Bluefield, W. Va.	6 x 9 1/4	40	22	12
Clarksburg, W. Va.	9 x 6	48	43	2
Dubuque, Iowa	6 x 9	84	9	5
Excelsior Springs, Mo.	5 1/2 x 8 1/2	52	16	3
Lynchburg, Va.	8 1/2 x 11	96	19	11
Norwood, Mass.	6 x 9	272	..	..
Pasadena, Cal.	6 x 9 1/4	56	5	17
Salina, Kans.	9 1/4 x 6	60	12	2
Tallahassee, Fla.	6 x 9	56	12	3
Westmount, Que.	9 x 12	44	..	..
Wichita, Kans.	6 x 9	24	..	..

ORGANIZATION CHART-CITY OF PASADENA



ONE OF SEVERAL CHARTS FROM THE PASADENA REPORT

The front cover of the Pasadena report contains much information of value to the taxpayer. This includes a chart, "How Your Dollar Has Been Spent," and a table giving population, assessed valuation, bonded indebtedness, city tax rate, county tax rate, and per capita income of the municipality from general taxes and from licenses, fines, fees, charges, etc. There is also a prominent line reading, "City owns its light, power and water utilities." Charts showing the assessed valuation of Los Angeles County and "How the County Dollar Has Been Spent," appear on the back cover.

Letters from City Managers

In reply to inquiries addressed by THE AMERICAN CITY to the city managers in these twelve municipalities as to number of copies printed, cost and method of distribution, and comments which might be helpful to other cities, the following information has been received:

Alliance, Nebr.—We had about 1,000 copies printed at a cost of \$350. The reports were distributed by carrier, who called at the various business places and handed them to the proprietor or any one interested. In this way we could get in personal contact in making delivery of these reports.

If an annual report is to pay for the task involved, it should be easily read and understood by a large majority of people. Some persons understand a table of figures, while others can get an idea from a picture or graphic chart more easily. In my report I gave them the same story in these three forms. If they take the trouble to study all three of these methods, by the time they have finished the third one they have a pretty good idea of what the facts are.

N. A. KEMMISH,
City Manager.

Bluefield, W. Va.—The cost of the cuts for our reports amounted to \$92.05. The printing

of the reports, in addition to the cost of the cuts, amounted to \$469.25, plus \$34.50 for the envelopes, making a total cost of \$595.80; total number of reports, 5,000. We obtained our mailing list for the distribution of these reports from the local electric light company. This list contained approximately 98 per cent of the residents within the city. We also announced through the local press that any one failing to get a copy could obtain one by calling at any of the city offices or by telephoning.

It will be my constant aim to decrease the reading matter and increase the illustrations, charts and diagrams, for the reason that I believe most people will take the time to get the information out of a picture or chart, while if it were printed it would be very doubtful if many gave it their serious attention.

CLARENCE E. RIDLEY,
City Manager.

Clarksburg, W. Va.—We printed 4,000 copies at a cost of approximately 12 cents per copy. We are distributing them to the homes through Boy Scouts in the chief residence sections, are stacking them for distribution at the tax windows, and are using them at luncheon meetings of civic organizations. Civic classes in the high schools are studying the reports, and announcements are appearing in our daily papers that any one not receiving a copy may do so by telephoning the City Hall. This method does not reach all citizens, nor even all taxpayers, but it does make the report available to the great majority of the homes.

HARRISON G. OTIS,
City Manager.

Dubuque, Ia. — There were 1,500 copies printed at a cost of approximately \$400. Some 60 of these reports were mailed to various residents, 150 were taken to the Trades and Labor Council rooms for distribution, and about as many more to the Chamber of Commerce. They were also distributed to the various civic organizations, such as the Rotary, Kiwanis, and Lions Clubs, at one of their meetings. Copies were also available at the City Hall for any who desired them.

O. E. CARR,
City Manager.

Norwood, Mass.—Of these reports, 1,200 were printed for distribution from the Town Clerk's office to those citizens who are interested enough to ask for them.

W. P. HAMMERSLEY,
City Manager.

Pasadena, Calif.—The cost of our second annual report was \$562.63. This report contains 56 pages and we had 1,000 copies printed. The names of all city managers in the United States and Canada are put on our mailing list; also a great many municipal and college research libraries. The report is distributed to our own people through the Chamber of Commerce, Shakespeare Club, and Woman's Civic League, and by placing them in the windows of our utility offices in the City Hall.

The writer feels that the city manager's report, like all public documents, should be made as brief as it is possible to make it. If it is made too voluminous, it is not read. In all

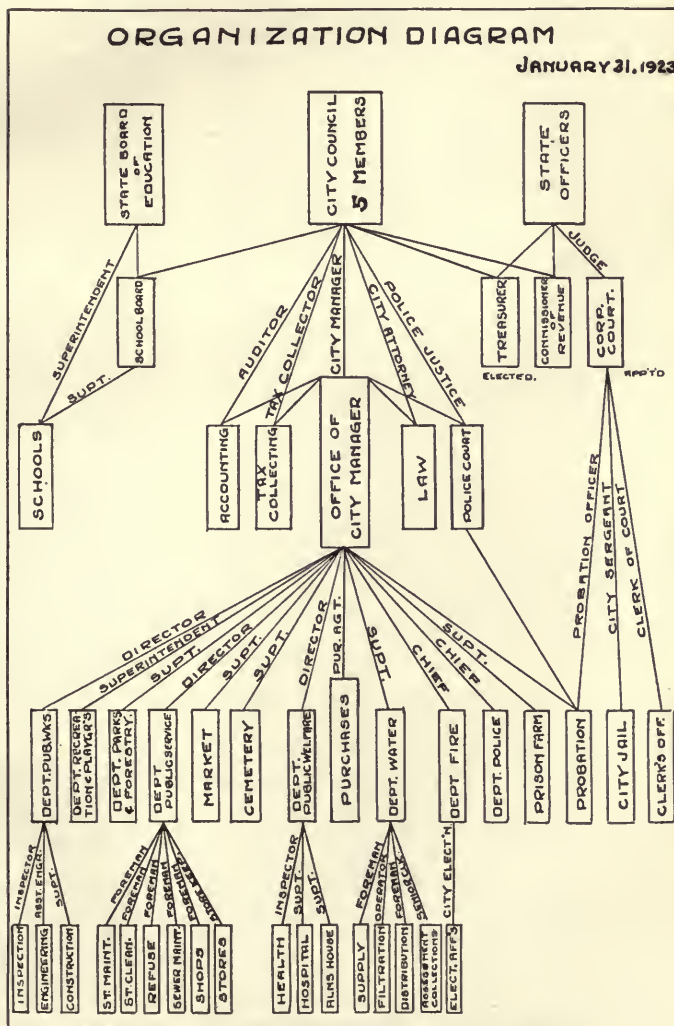


CHART FROM THE LYNCHBURG REPORT

reports of the city of Pasadena, we put on the front cover as much essential information as possible that many people want to know, which can thus be had at a glance without searching through the book. I would like to see every city manager make an annual report covering the activities of his city for exchange with other city manager cities. Some of the reports that come to my office contain only a small page by the city manager. It seems to me the manager ought to be the person responsible for the city report and should write it in full, as he is the connecting link between the people and the city council.

C. W. KOINER,
City Manager.

Salina, Kans.—We had 600 copies of these reports printed. About 400 went to mayors, city managers and other officials throughout the state, and at least 200 were distributed among our home folks, especially in our business institutions.

W. A. LAYTON,
City Manager

Tallahassee, Fla.—We had 1,500 copies printed at the following cost: cover, \$43.00; 12 full-page cuts, \$91.03; body, \$452.66; total cost, \$586.69. We sent a copy to every taxpayer on the city's rolls. We mailed copies to city managers, members of the Florida League of Municipalities, various research bureaus and libraries, and magazines interested in municipal affairs.

The various department heads will usually respond with a wealth of data, information and photographs upon request. The City Manager, or his assistants, edits this; the Manager writes his report and recommendations; inserts the financial report, abbreviated as much as possible, yet containing all information that the taxpayer should be informed on; and such cuts, graphs, etc., as the editor may want.

W. AUSTIN SMITH,
City Manager.

Westmount, Que.—We have 500 annual reports printed and mail a copy to all the principal bond brokers in Canada, as well as a number in the United States; to all the city clerks throughout the Dominion, and a number to private individuals who have asked that they be put on our mailing list.

GEORGE W. THOMPSON,
General Manager.

Wichita, Kans.—We had but 500 copies of this report printed. The total cost was \$89.75. This report was mailed around to cities with which we exchange reports, was sent to prominent citizens of Wichita, and to individuals from whom we had inquiries.

EARL C. ELLIOTT,
City Manager.

The following comments are from a city manager who believes that other methods of municipal reporting are superior to the annual report idea:

Middletown, Ohio.—This city is getting out only an Auditor's Report, which is required by law and shows only a statement of financial facts and is not very interesting reading. I

have not made any changes in this plan, because I do not think an annual report is read by enough people to really justify the expense. The friends of the administration will go through it and believe the statements that are made. The passive citizens and the opposition give it no attention at all.

I believe in making statements of the city's financial condition and reports regarding the activities of the city government in the newspapers and making them frequently. I also make reports to the City Commissioners, giving each Commissioner a copy, dealing with the execution of policies which they have enacted and giving a full account of the progress in all improvement work. At the beginning of each year I prepare a report on all improvement work, petitioned for and suggested, together with estimates of the cost, giving the funds available, and from this the Commissioners decide the amount of work to do. Then each month I report the progress of this work, both as to the legal procedure and the actual construction. I give monthly, quarterly and semi-annual reports of the city's financial condition, showing a statement of expense in each fund as compared with the budget.

The newspapers in Middletown have been very liberal in the publication of these reports. In this way, I believe, the people are kept as well informed in city matters as it is possible to inform them; but even though these facts are prepared in an interesting way, there are a good many people who fail to read them. These people we try to meet personally. Of course, it would be impossible for the administration to deal with people directly in this way, but in order to have an organization to pass out such information by word-of-mouth, we organized a Citizens Advisory Committee. The members of this committee have done a great deal to aid in the explaining and advising necessary to keep the people properly informed as to city government.

An interesting annual report in addition to all of this other information would be valuable, but it would be nothing more than a compilation of the reports made from time to time during the year, and these Ohio cities are too hard up to figure that they can afford an attractive annual report. The newspapers have, of course, handled this publicity without cost to the city, and occasional full-page advertisements in the newspapers are made possible by funds donated by The American Rolling Mill Company. It is quite possible that in a city where the newspapers would not handle these reports liberally or without cost there would be no other method except an annual report.

KENYON RIDDLE,
City Manager.

Special Features in Certain Reports

The Tallahassee report is evidently intended to do more than merely convey information; on several pages there are "boxes" in which are reprinted quotations of an inspirational character from THE AMERICAN CITY. There is also a two-page

statement of the advantages of Tallahassee as a place in which to live and to make a living, contributed by the local Chamber of Commerce.

Only three of the twelve reports under discussion contain a table of contents or an index—a feature of convenience to the reader to which a page might well be devoted in every annual report.

The report of Norwood, Mass., is much more voluminous than any of the others. Among the space-consuming features are complete lists of all births, marriages and deaths for the year, and a tabulation of all the school teachers by name, with figures as to enrollment, attendance, etc., in their classes.

The Lynchburg report is the handsomest and best-printed report of the twelve, but probably represents a greater expenditure than would be generally regarded as justified.

A full-page paving map, showing work done in recent years, is a valuable feature of the Clarksburg report, as is also a series of well-displayed financial tables, each with explanatory comments in parallel columns.

The Bluefield report has an excellent feature, which may have been suggested by some of the modern chamber of commerce reports with their programs of work and statements of accomplishments. Three pages are devoted by the City Manager of Bluefield to brief statements, under the

headings of the various departments of the city government, of "Recommendations Contained in Last Year's Report" and "Recommendations Carried Out to Date." Another excellent feature is a page on which are listed the appropriations and expenditures for the year 1922-23, with the balance or deficit for each item of the budget. It must be gratifying to the people of Bluefield that the column of balances totals \$51,305.62, as against \$16,535.21 for the column of deficits.

A Seminar on Municipal Reporting

The concluding paragraphs are from a valuable summary by Louise Overacker in the *National Municipal Review* for December, 1923, of the results of a seminar on municipal reporting conducted at the University of Chicago by Professor C. E. Merriam:

"An analysis of the possible functions a municipal report might serve led to the conclusion that its most useful function would be as a measure of government efficiency. If popular government is to succeed, the voter must be able to measure the service his city is rendering him and to compare it with the service of yesterday, or with the service rendered by other cities. Such comparisons are impossible until the things to be compared have been reduced to a common denominator: in other words, until we have a yardstick or *standard* of measurement. The financial report was taken to illustrate how such standards might be developed. At the present time tax rates and per capita expenditures are our nearest approach to standards of measurement in this field. But a tax rate means nothing because of the wide variation in bases of property valuation, and per capita expenditures make no allowance for differences in prices and wealth from time to time and from city to city. More scientific standards of measurement might be devised by taking into consideration units costs, the purchasing power of the dollar, and community income.

"The development of the art of presenting material so that it will appeal to the average citizen was suggested as a field offering opportunities for infinite originality. Facts must be translated into the language of the average citizen and forced upon him so graphically and persistently that he cannot forget them. Some progress was made upon an outline of a 'model' year book which would contain useful information in popular form, special emphasis being placed upon the use of charts and graphs. It was also suggested that municipal 'reporting' should not be confined to the publication of annual reports and year books, but that the citizen should be constantly reminded of salient facts by means of posters, car cards, movies and the radio. The reverse side of tax receipts and vouchers, pay checks, etc., might also be used for publicity purposes."



From Dumping Ground to Playground



TWO OF SEVERAL EFFECTIVE LITTLE HALF-TONES FROM THE CLARKSBURG REPORT

The Municipal Hydro-Electric Power Plant of Winnipeg



By A. Vernon Thomas

WHY does Minneapolis, the largest American city near Winnipeg, pay 10 cents a kilowatt-hour for domestic lighting while the Winnipeg citizen pays only 2½ cents? The answer is simple: Winnipeg has a municipal hydro-electric plant, and Minneapolis has not. Winnipeg secured its hydro plant through the forethought and shrewdness of a former Winnipeg alderman, John Wesley Cockburn. Single-handed and on his own initiative, Mr. Cockburn went down to the Canadian capital at Ottawa and obtained a lease of the finest power-site on the Winnipeg River. Having got the lease, he put it in his pocket and held it for the city of Winnipeg against all comers.

The Winnipeg River is a swiftly flowing

stream east of the city, through which the great basin of the Lake of the Woods empties into Lake Winnipeg, a body of water almost as big as Lake Superior. In its course of some 200 miles there are nine possible power concentrations on the Winnipeg River, distant from Winnipeg by from 60 to 100 miles. These nine power-sites are capable of generating 614,000 horse-power, or more electrical energy than is used by the city of Chicago—and Chicago has to generate its electricity by steam.

Less than 20 years ago not a single horse-power on the Winnipeg River was being developed. In 1906 the Winnipeg Electric Railway Company completed a plant on the Pinnawa Channel of the Winnipeg River

at a point 58 miles from Winnipeg, and the company brought into Winnipeg over 58 miles of transmission line, a total of 34,000 horse-power. The plant, however, has never been a great success from an operating point of view because of the annually recurring ice trouble.

The Winnipeg Electric never seriously believed that the city of Winnipeg would build a hydro-electric power-plant of its own. When the company brought power into Winnipeg in 1906, it



SPILLWAY FROM THE FOREBAY OF THE MUNICIPAL HYDRO-ELECTRIC PLANT OF THE CITY OF WINNIPEG AT POINTE DU BOIS, WINNIPEG RIVER, MANITOBA

continued to charge 20 cents a kilowatt-hour, less 25 per cent, for domestic lighting, although it was then developing the power by water instead of by steam. The possibility of effective competition by the city of Winnipeg was not seriously entertained.

Colonel Ruttan, City Engineer of Winnipeg in 1906, was an enthusiast for a municipal hydro-electric plant. He amazed the City Council by drawing up a power prospectus in which he claimed most positively that power could be brought into the city from the Winnipeg River and sold at $3\frac{1}{3}$ cents a kilowatt-hour for lighting and at 1 cent for cooking. Nobody believed him, because at the time the citizens were paying 15 cents net for this service.

In due course, however, the private company began to take the situation seriously and reduced its rate for domestic lighting to 10 cents a kilowatt-hour, and before the city's plant at Pointe du Bois was completed it came down to $7\frac{1}{2}$ cents. Later, the rate was reduced to the city's rate of $3\frac{1}{3}$ cents.

The by-law empowering the city to spend \$3,250,000 for an initial installation of 20,000 horse-power carried by a large majority in the Manitoba Legislature. Contracts were let, consulting engineers appointed, and the plant duly completed. The prediction of Colonel Ruttan, looked upon at the time as crazy, has been fully realized. The city hydro started in, in 1911, with a rate of $3\frac{1}{3}$ cents, less 10 per cent, for domestic lighting, and has gradually reduced this and other rates.

To-day the city's municipal plant has 48,000 paying customers, which means that it does 90 per cent of the city's domestic lighting. It lights the city's 3,600 street lamps and supplies power to 5,000 electric cooking ranges and 2,000 domestic water-heaters. These latter services bring in a revenue of about \$300,000 annually.

As recently as December, 1922, a combination light and cooking rate of 3 cents and 1 cent respectively became the general residential rate for all the city hydro's cus-

tomers. This resulted in a saving to the latter in the first month of about \$6,000. The average net rate to-day for residential lighting is $2\frac{1}{2}$ cents.

During the summer of 1922 two bad storms struck the city and vicinity and did considerable damage to the hydro's distribution system in Winnipeg, also to its transmission line. Power was off some 24 hours on one of these occasions. The City Council immediately decided to construct a steam standby plant of 15,000 horse-power, at a cost of \$600,000. Contracts for the heavy machinery of this plant have already been let, and plans for the building



POWER SITE RESERVED FOR THE CITY OF WINNIPEG, SIX MILES BELOW THE PRESENT DEVELOPMENT AT POINTE DU BOIS

Additional 70,000 horse-power can be generated at this site

are nearing completion.

During the period since 1911, the city hydro plant has set aside out of earnings, after paying interest and sinking fund, maintenance and operation, the sum of \$475,000, and it has to-day a surplus of \$300,000. Not only this, but the hydro has paid into a depreciation fund, at the order of the provincial Public Utilities Commissioner, the sum of \$2,000,000. This means that when the bonded indebtedness of the plant is wiped out, about 30 years from now, the citizens will have a plant more valuable than the day it was built and with not a cent against it, and with enough money in the depreciation fund to build a similar plant. The plant's total assets to-day amount to \$17,000,000, and the reserves to \$3,750,000. The gross earnings in 1922 were \$1,659,725.

The Pointe du Bois power-site covers an area of 438 acres, and lands have been flooded to the extent of 4,222 acres. The

fall obtained is 46 feet, and 70,000 horse-power is developed, the peak load at the present time being 51,000 horse-power. Eleven alternators, generating 3-phase, 60-cycle, 6,600-volt power, occupy the powerhouse, and there is still room for five more units, each of the same capacity. The power is stepped up from 6,600 to 72,000 volts and brought to Winnipeg over two transmission lines of two circuits each. In Winnipeg the high voltage is stepped down to 12,000 volts, and at the six substations in the city this 12,000-volt power is stepped down to 2,300 volts, finally reaching the consumer at from 110 to 220 volts for

lighting and cooking and at 550 volts for power.

Power is sold to half a dozen municipalities either adjacent to Winnipeg or along the route of the transmission line. Power in bulk is also sold to the Province of Manitoba for distribution to other portions of the province by the Manitoba Hydro-Electric Commission. In this way, power is used 150 miles from Pointe du Bois.

The city of Winnipeg holds the lease of a second power-site on the Winnipeg River. This site is situated six miles below the city's present development, and will, when needed, add 70,000 horse-power.

School Expenditures--1917-1922

THE Federal Department of Commerce has prepared the accompanying table of the expenditures for educational purposes other than for libraries in cities having a population of 300,000 to 500,000 in 1922.

This tabulation shows the total and per capita payments for expenses, that is, teachers' salaries and other expenses for the operation and maintenance of schools; the per cent which such payments form of the total for all

departments exclusive of public service enterprises such as water-works and light plant; and the per cent of increase between the years 1917 and 1922.

The statement includes statistics for all outlays, or payments for permanent improvements for schools whether such outlays are financed from the ordinary revenues of the city or through bond issues, and in each city large increases are shown for this object:

Rank in Population 1922	City, and Ending of Fiscal Year of Schools	School Expenses (Maintenance and Operation)				School Outlays			
		Total	Per Capita	Per Cent of Total Payments for Expenses of All General Departments	Per Cent of Increase 1917 to 1922	Total	Per Capita	Per Cent of Total Payments for Outlays of All General Departments	Per Cent of Increase 1917 to 1922
13	Milwaukee, Wis.								
	Dec. 31, 1922.....	\$5,765,000	\$12.08	33	104	\$1,703,000	\$3.57	22	124
	Dec. 31, 1917.....	2,823,000	6.44	29	...	760,000	1.73	12	....
14	Washington, D. C.								
	June 30, 1922.....	5,428,000	12.40	31	92	2,069,000	4.73	40	223
	June 30, 1917.....	2,821,000	6.97	29	....	641,000	1.58	26	....
15	Newark, N. J.								
	June 30, 1922.....	6,762,000	15.66	36	104	1,554,000	3.60	34	207
	June 30, 1917.....	3,319,000	8.35	31	....	506,000	1.27	22	....
16	Cincinnati, Ohio.								
	Aug. 31, 1922.....	5,937,000	14.66	41	100	984,000	2.43	21	125
	Aug. 31, 1917.....	2,972,000	7.47	30	..	438,000	1.10	15	..
17	Minneapolis, Minn.								
	Dec. 31, 1922.....	5,282,000	13.17	38	74	3,239,000	8.08	41	655
	Dec. 31, 1917.....	3,039,000	8.44	38	....	429,000	1.19	13	....
18	New Orleans, La.								
	June 30, 1922.....	3,397,000	8.50	33	204	156,000	1.29	24	1,620
	June 30, 1917.....	1,118,000	2.98	23	....	30,000	0.08	2	....
19	Kansas City, Mo.								
	June 30, 1922.....	4,438,000	13.10	34	131	1,532,000	4.52	57	882
	June 30, 1917.....	1,918,000	6.37	29	....	156,000	0.52	4	....
20	Indianapolis, Ind.								
	June 30, 1922.....	4,082,000	12.19	38	149	2,901,000	8.66	33	873
	June 30, 1917.....	1,637,000	5.55	37	....	298,000	1.01	10	....
21	Seattle, Wash.								
	June 30, 1922.....	4,481,000	14.20	36	103	1,778,000	5.63	24	169
	June 30, 1917.....	2,210,000	7.48	30	....	660,000	2.23	16	....
22	Rochester, N. Y.								
	Dec. 31, 1922.....	4,912,000	15.77	40	194	3,027,000	9.72	36	947
	Dec. 31, 1917.....	1,673,000	6.20	29	....	289,000	1.07	16	....
23	Jersey City, N. J.								
	June 30, 1922.....	3,453,000	11.29	27	88	997,000	3.26	28	11
	Nov. 30, 1917.....	1,834,000	6.32	29	...	900,000	3.10	60	....

Relation of Depth of Foundations of Pavements to Their Strength

By Clarence D. Pollock

Consulting Engineer, New York

AN old macadam pavement has proved a good foundation in many cases when it was not necessary to make openings in it for subsurface structures, but usually in city streets the most satisfactory foundation is one of portland cement concrete, commonly mixed in the proportion by volume of one part cement to three parts sand and six parts of broken stone or clean washed gravel. This foundation is generally laid either 5 or 6 inches in depth upon a well-compacted subgrade. Where the subsoil is sand or sufficiently porous material to provide good drainage, these depths have proved sufficient even for present-day traffic. In the borough of Manhattan, New York City, where a 6-inch concrete foundation is used and the cost of repairs due to foundation failures has been kept separately, it was found that the charges amounted to less than 1/10 of 1 per cent of the total cost of repairs per year.

Any increase in depth of foundation here would surely be unnecessary and a waste of money. Some cities have had a tendency to lay heavier foundations, but with good subgrade material it would seem to be expensive insurance. It is true that New York has generally good subsoil conditions, but it is an ever-changing city and probably has more construction openings made in its pavements per mile per year than any other city. There is frequent settlement of

the subsoil in these pits, but the concrete usually bridges over the moderate-sized ones and carries the traffic. On Fifth Avenue it was found that 6 inches of concrete foundation had bridged over a span of 6 feet and had carried the traffic of that heavily traveled thoroughfare safely for years, although busses on that street when loaded weigh from 7 to 10 tons and carry from 6 to 10 tons on the rear axle.

Study of Foundation Courses

The foundation is a very important part of a pavement and is a considerable item in both the first cost and the maintenance of the pavement and should therefore receive the careful consideration which it deserves. The foundation should be sufficient to transmit the load on the pavement surface to the subgrade without material deformation and spread the load over a sufficient area of the soil so that its intensity does not exceed the safe bearing power of that soil. Too little attention has been paid to this portion of the pavement in the past, but with the much heavier loads of modern traffic more consideration is being given this matter. The Bureau of Public Roads has made and is now making tests to obtain more data in regard to the behavior of slabs under varying conditions of loading and impact and different conditions of subsoil, and others have been working along similar lines, but there remains a great deal to be learned concerning this subject.

Improving the Subgrade vs. Heavier Foundation

When the subsoil is of clay or other material which cannot be readily drained, from the present progress of tests it would seem advisable to improve the subgrade rather than to weight it with a heavier foundation. A dry clay is usually capable of sustaining a load of 5 tons per square foot, but when very wet the same clay may not sustain more than 1 ton per square foot. By excavating a few inches additional

and replacing with sandy or gravelly material, the load will be spread so that with this and the better drainage a much greater load may be supported.

The foundation cannot act as a beam until the subsoil gives away sufficiently to allow it to act as such. The better the subsoil, the greater the load required to deform the foundation. The Washington tests show that with the subgrade support the sustaining power of the concrete founda-

tion varies more nearly as the square of the depth than directly as the depth.

Measurements show that the foundation in transmitting the load to the subgrade does not transmit it so that the pressure intensity is uniform. The pressure intensity is highest directly under the load, and spreads out over a considerable area, diminishing to nothing at some distance from the load. The intensity of pressure under the load must exceed the bearing value of the soil underneath before the foundation can act as a beam. Even a macadam, bituminous macadam or bituminous concrete foundation will not be deformed until the intensity of pressure directly under the load exceeds the bearing value of the subsoil. If the load is stationary or if the surface of the pavement is very smooth, there will be simply the static pressure, but if the surface of the pavement is a little rough, there will be impact, and if the surface is quite rough this impact may amount to four to five times the static pressure. This is greatest when the tires are badly worn; with good, well-cushioned tires the impact apparently approaches more nearly the static load, and hence the advisability of securing as uniformly smooth a surface to the pavement as possible in order that the impact of moving loads may be eliminated as completely as can be done.

In the Bureau of Public Roads tests with slabs on wet and dry soils, the impact tests punched through the 4-inch slabs, but those of 6 inches in depth and greater were simply cracked, on up to those 10 inches thick, which could not be broken by the apparatus even on the wet subgrades. According to this, a thickness of 10 inches should be sufficiently great to carry any load that might come upon the pavement even with a wet subgrade, which may be more or less plastic. However, we are not so likely to have wet subgrades in city streets subject to heavy truck traffic, as the pavement is usually impervious to water, and the sidewalks are generally paved so that there is much less likelihood of subsoil troubles here than with suburban roads. But should there be bad subsoil conditions, in general it will be found much less expensive to improve the subgrade than to pay for 4 extra inches of concrete in addition to the extra grade removal, which alone would in most cases be sufficient when replaced by a more porous coarse-grained material that is not affected materially by water, as are the very

plastic soils, such as many clays. With proper support from the subsoil and a reasonably smooth surface to the pavement, a thickness of 6 inches for the concrete foundation seems adequate, especially as most heavy loads are now hauled on auto-trucks having rubber tires. The trucking interests have found that it is not economical to carry loads in excess of about 750 pounds per inch width of tires. This insures wide double and triple solid rubber tires on each rear wheel and a good distribution of the load over the pavement, so that by the time it is spread through the thickness of the pavement and the concrete foundation, the pressure intensity is usually well within the supporting value of the soil. Some states have limited the loads permitted on their highways, but here we have a limit placed by the effect on the truck owners' pocketbook, which is more easily enforced than the other.

When in exceptional cases it may be necessary to use a greater depth of concrete than 6 inches, it should be remembered that the supporting power of the concrete foundation varies about as the squares of the depths. For example, 7 inches depth of concrete would have about 1 1/3 the supporting power of 6 inches of concrete, 8 inches of concrete 1 3/4, 9 inches 2 1/4, and 10 inches 3 times nearly the supporting power of 6 inches of concrete. Keeping this in mind should prevent wasting money in using too great an increase in depth in special cases.

Another matter that the tests have brought out is the fact that while the compressive strength of 1:3:6 concrete was 50 per cent of that of the 1:1 1/2:3 concrete, the difference between the beam and slab strength of these two mixtures did not exceed 20 per cent.

Damage from Swelling of Subsoil

In addition to damage from heavy loads, the pavement, including its foundation, may be injured by water entering a clayey or other plastic subgrade material from terraces or sidewalks and lifting and cracking the foundation and pavement by the swelling of the subsoil. Sometimes this may be caused by frost heaving the foundation when there is a large amount of water in the plastic soil under the foundation. During the past season the writer was engaged upon an examination of some breaks in foundation and pavement where a study of

the conditions shown by openings and the history of the breaks—as to when they were noticed after the completion of the pavements and before freezing weather and the soil condition in the terraces on the up-hill side and the clay of the subsoil—showed conclusively that the breaks were due to the soil conditions and not to any loads to which the pavement had been subjected. These are further reasons for improving the subsoil rather than increasing the depth of the foundation, as a considerably heavier foundation would probably have been broken by the heaving of the clay when it became wet, and if not by this then later by the action of the water in the subsoil, freezing, and lifting the pavement. About twenty years ago the author had several streets paved with asphalt on concrete foundation in a suburban development, where there was a layer of clay directly under the foundation and wide grass-plots back of the curbs. A severe winter fol-

lowed a wet fall and caused this pavement to be lifted as much as 2 inches in places, as evidenced around sewer manhole heads. After the frost went out of the wet clay, the pavement settled back, but unevenly, and cracked badly in so doing. Since that experience the writer has been very chary about placing the foundation directly on clay or other plastic material if there was any chance that water might penetrate it. Whether in a cold or in a warm climate, water alone will cause it to swell and lift the foundation, and frost will increase its volume still more.

From our present knowledge we believe that a 6-inch depth of foundation is sufficient to carry modern traffic, provided the subsoil is good; and that, if it is poor, it is better to improve the subsoil rather than to use additional concrete in cases of this nature.

ACKNOWLEDGMENT.—From a paper read before the American Society for Municipal Improvements, November, 1923.

The Ancient Fire Engine

A Parable of Safed the Sage

THERE is a man who buyeth Junk. And his Shop is filled with Rags and Bottles and all manner of old truck, save that he hath no place to dump the Stories that are told by After-Dinner Speakers. And that is a Pity. And in his Yard are piles of old Iron, and Rusty Iron Beds, and Windows out of which People have looked that now are Dead and their houses torn down; and Doors across whose thresholds have walked the mourners carrying the coffins of those who builded the houses; and marble mantels that are tombstones of dead homes. And if there be any other kinds of old junk, behold, they are there.

And one day there stood before the door of the Shop an Ancient Fire Engine. For the City had sold it for Junk and bought a new one, and the Junk man had bought the old one as a job lot. And the old Engine stood there, all forlorn. The boiler thereof was rusted and dented, and the brass thereof was tarnished.

And I stopped as I passed by, and I contemplated the poor old wreck that stood there in its Desuetude with none so poor to do it reverence.

And I said, Is not this the Engine which the city bought with a Special Bond Issue, and was it not the Pride of the town? Did it not go garlanded in processions, with Red-shirted firemen Helmeted and Fierce-looking guarding it as it went? And when there was a Fire, did not this Engine start forth from the Engine-house, the firemen sliding down the Brass Pole and dressing as they slid, and the Horses

suorting as they rushed from their stalls at the first clang of the Bell?

And I felt like crying unto the multitude, all of them rushing along as if they really were going somewhere, Is it nothing to you, all ye that pass by?

And I remembered the uplifted ladder, and the firemen carrying the nozzle, and the hose stiffening as the water began to fill it, and the Angry Hiss with which the Fire retreated and went down; and the horses, that had come to the fire on the run, poking along home, dragging the Victorious Engine. And behold, it stood before the Junk Shop in dishonor.

But I said, It is now too late to give glory unto the old Fire Engine. It hath performed its service, and had its glory. It needeth not that it go garlanded unto its grave. Let its Brass be cast into the Furnace, and its Iron be molten again, and let it serve other uses in other forms. For, as they were wont to say in Rome, *Sic transit gloria mundi*, which is in the Latin tongue, and meaneth, Thus passeth the glory of this world.

But I could not go by unheeding. And on that morning Keturah had given unto me a Rose, and I was wearing it in my Button Hole. And I removed it, and I laid it reverently on the Old Fire Engine. And I said, Though all the world care not, I and Keturah we care. So that which was about to die did I salute in honor of the glory that had been in its long years of Heroick Service.

—From *The Christian Century*.

Queen City Bridge, Manchester, N. H.

By C. A. Farwell

Fay, Spofford and Thorndike, Consulting Engineers, Boston, Mass.

THE new Queen City Bridge at Manchester, N. H., is located at the southerly end of the city, about a mile down the river from the existing Granite Street bridge. It starts from the relatively low-lying second bench on the westerly side and rises, by grades of from 1.73 to 3.75 feet per hundred, to the higher second bench on the easterly side, passing over the lower benches, the river and the railroad tracks.

The total length of the bridge between abutments is 1,182 feet, 457 feet of which is over the river. Riveted steel trusses resting on concrete piers support the deck of the river spans. The deck slab, curbs, sidewalks and balustrades are of reinforced concrete. The viaducts over the low-lying land on either side are of reinforced concrete throughout except for the long span over the railroad right of way, where structural steel girders were used.

The foundations for the westerly viaduct rest on concrete piles, as this bank is "made" land; otherwise the foundations are carried by the soil at safe distances below the surface, those for the river piers being carried down to the hard-pan overlying the rock.

The roadway, 40 feet between the curbs, is paved with a bituminous macadam surfacing, and the two sidewalks, each 8 feet wide, have a concrete surface. Provision is made beneath the sidewalks for the installation of the necessary conduits. The bridge is designed to carry street railway tracks, but none are being installed at the present time.

The architectural treatment, though simple, is effective, and care has been used to insure good lines in all parts of the work. The sunken panels of the railing have been "bush-hammered," the remainder being rubbed to a smooth surface, and this results in a very pleasing contrast. Ornamental bronze posts are provided at the ends of the river bridge and abutments.

The total cost of the bridge, including the approaches, 420 feet in length, will be about \$900,000.

George E. Trudel is Mayor, and the Highway Commission, under whose direct supervision the bridge is being built, consists of John H. Gleason, Joseph Quirin and L. J. Farrell. H. S. R. McCurdy is the Commission's surveyor, Fay, Spofford & Thorndike are the engineers, and T. Stuart & Son Company the contractor.



A PORTION OF THE QUEEN CITY BRIDGE, MANCHESTER, N. H., UNDER CONSTRUCTION

The Need for Covering Open Service Reservoirs

The Protection of Filtered or Ground Water from Contamination Is Positively Necessary

By George C. Bunker and August C. Nolte

Engineer and Assistant Engineer in Charge of Water Purification, Panama Canal

THERE is no doubt that the present-day tendency of water-works practise is strongly toward the covering of new service reservoirs in which either ground or filtered waters are to be stored at the time they are built; while the old uncovered reservoirs are gradually being covered after the misdirected influence of amateur water-works men, present in every community, has been overcome by practical demonstration of what it means to interrupt the water service of a reservoir by frequent cleaning for removing growths of algæ. Six reasons may be given for the covering of a service reservoir at the time of its construction:

1. To maintain the water-supply in the same condition of purity in which it leaves the purification plant or ground, by (a) preventing the entrance of dust, bird droppings, leaves, soot and other foreign matter, and (b) preventing the growth of algæ.

2. To eliminate frequent cleanings of the reservoir, which means that the maximum storage capacity of the system is always available in case of a shut-down of the purification plant or the pumping-station.



LOW-SERVICE RESERVOIR AT ANCON, CANAL ZONE, SHOWING THE ROOF WHICH WAS CONSTRUCTED IN 1921

3. To lessen the danger of the pollution of the reservoir by the gangs engaged in cleaning it or by trespassers.

4. To prevent loss by evaporation and to maintain the water at a uniform temperature.

5. To effect a saving in the cost of a roof, which sooner or later must be constructed, because it can be built at a minimum cost and with no interruption to the water service if built coincident with the reservoir.

6. Because an uncovered reservoir has no place in a well-designed water-supply system, according to the collective expression of engineering judgment.

ACKNOWLEDGMENT.—From a paper read before the Annual Convention of the New England Water Works Association.

The Collection of Ashes and Paper in Newton, Mass.

IN the collection of ashes and papers in Newton, Mass., both teams and trucks are used. During the last fiscal year, the cost per ton for collection, including the care of dumps, was \$1.19, and per cubic yard, 64 cents. The cost of collection for ashes, papers and rubbish, exclusive of the care of the dumps, was \$1.09 per ton, or 58 cents per cubic yard. With

a population of 47,674, the cost per capita for collection of ashes, habitation and commercial waste and the care of dumps was \$1.32. Measurements have shown that one cubic yard of ashes as collected weighs 1,110 pounds, and one cubic yard of papers weighs 184 pounds; 2,219 pounds of wastes was collected per capita during 1922.

Status of the Garbage Problem at Buffalo

An Interesting Discussion of Improved Disposal by Hog-Feeding

By Harrison P. Eddy

Metcalf & Eddy, Consulting Engineers, Boston, Mass.

FOR many years Buffalo has provided the separate collection of ashes, rubbish and garbage. The ashes have been used for filling; the rubbish has been sorted, the salable material salvaged, and the residue incinerated. Recently the garbage has been fed at a municipal piggery about $8\frac{1}{2}$ miles from the center of the city and about $3\frac{1}{4}$ miles outside city limits. The piggery refuse has been removed to neighboring land, where it has caused objectionable odors, resulting in serious complaints. An injunction was issued restraining the city from continuing the operation of the piggery after September 15, 1923.

On July 25, 1922, bids were received in response to an advertisement which contained the following specifications:

"For the necessary machinery and equipment for the incineration or reduction of all garbage collected by the city of Buffalo, which machinery and equipment must have a capacity of 200 tons per day. Bidders must submit detailed plans and specifications showing their method of incineration or reduction, including the cost of operation per ton, the commercial value of the residue, the names of cities where similar plants are being operated, and a guaranty that no obnoxious gases or odors will be created through operation"

"For the necessary machinery and equipment for the incineration or reduction of some of the garbage of the city of Buffalo, which said machinery and equipment must have a capacity of at least 50 tons per day. Bidders must submit detailed plans and specifications showing their method of incineration or reduction, including the cost of operation per ton, the commercial value of the residue, the names of cities where similar plants are being operated, and a guaranty that no obnoxious gases or odors will be created through operation"

It was the intent of this advertisement to secure two sets of bids, one for a plant for the incineration or reduction of green garbage, and the other for like treatment of the refuse from a municipal piggery.

Bids were also requested for parcels of land suitable for a site for a garbage disposal plant, but at the time the bids for disposal plant equipment were submitted to the author for examination and report as to which was most favorable for the city, the site for such a plant had not been selected. Therefore the problem of hauling the garbage to the disposal plant, and the

cost thereof, could not be considered.

A review of the bids led to the conclusion that none of them would provide a thoroughly satisfactory garbage disposal plant with respect both to cost of installation and operation on the one hand, and to the sanitary disposal of the garbage with freedom from odor in operation, on the other; for the following reasons:

The plant is to handle green garbage or piggery refuse which contains approximately 75 per cent moisture;

The incineration of such material by itself, without serious danger of the escape of objectionable odors, is impracticable;

The addition of fuel would have to be regulated according to the character of the garbage, with respect to its moisture content; such regulation would depend upon the intelligence, judgment and fidelity of operators; and lapses in effective control would result in a waste of fuel on the one hand, or the escape of objectionable odors, on the other;

In the case of incineration of piggery refuse, the danger of escape of objectionable odors would be even greater than in that of incineration of green garbage;

None of the incinerators bid upon have been operated in this country on anything but a very small scale, if at all, and such operation as has been cited by the bidders appears to have been on mixed refuse and not upon garbage alone;

The estimates of cost indicate that incineration of the green garbage or of the piggery refuse would be more expensive than disposal by other methods provided for in the proposals.

In view of the fact that the city was operating a piggery and appeared to be realizing a nominal profit upon the enterprise, careful consideration was given to its continuance, if possible, upon a basis which would avoid the objectionable features.

The conclusion was reached that it is possible to so design, construct and operate a piggery that it shall not create offensive conditions in the neighborhood if situated upon a tract of land affording reasonable isolation. This conclusion was based upon the further important provision that meas-

TABLE 1. DATA SHOWING DAILY QUANTITIES OF GARBAGE DELIVERED TO AND REFUSE FROM BUFFALO PIGGERY

Date	Number of Hogs	—Garbage Delivered—		—Refuse—		Per Cent of Garbage Delivered
		Total Tons per Day	Pounds Per Hog per Day	Total Tons per Day	Pounds per Hog per Day	
Feb. 21 } 22 } 23 }	Average for 3 days	4,247	50.17	23.6	30.41	14.3
24.....						
Feb. 26.....						
27.....	4,240	49.81	23.6	26.42	12.5	53.0
28.....	4,240	75.19	35.4	36.55	17.2	48.6
Mar. 1.....	4,340	60.44	27.9	33.33	15.4	55.3
2.....	5,272	54.41	20.7	30.29	11.5	55.5
3.....	5,257	52.77	20.0	30.53	11.6	58.0
4.....	5,133	59.78	23.3	34.10	13.3	57.0
5.....	5,133	56.25	21.9	29.23	11.4	52.0
6.....	5,128	65.47	25.6	35.37	13.8	54.0
7.....	5,124	54.86	21.4	30.28	11.8	55.3
8.....	5,124	53.48	20.9	28.94	11.3	54.0
9.....	5,110	47.03	18.4	25.97	10.2	55.4
10.....	4,990	50.90	20.4	26.18	10.5	51.5
11.....	4,866	53.20	21.9	26.68	11.0	50.2
12.....	4,366	70.38	28.9	38.11	15.7	54.2
13.....	4,866	57.99	23.8	31.07	12.8	53.6
14.....	4,740	50.66	21.4	27.52	11.6	54.3
15.....	4,740	51.86	21.9	29.23	12.3	56.4
Average (23 days)....	4,789	48.47	20.2	26.57	11.1	54.8

ures be taken for the prompt and sanitary disposal of the piggery refuse, which also was found to be possible. The most practical method of accomplishing this appears to be by reduction, to recover grease and fertilizer, or by drying and utilizing the entire product as fertilizer; these processes to be carried out in plants so designed and of such capacity as to be capable of unvarying efficiency of operation under variable conditions, such, for example, as the quantity of refuse produced. Such a disposal plant is a novel adjunct to a piggery and in the opinion of the author places the practicability of a large municipal plant of this type upon an entirely different sani-

tary footing from that upon which it formerly rested.

While the estimates indicate that the piggery alone could be operated at a substantial return above annual charges, the disposal of the piggery refuse would cost so much that the net result of the operation of a piggery with its supplementary disposal plant would be a source of substantial expense if fixed charges be taken into account, even though on the average there would be a substantial return in excess of operating cost.

While the advertisement requesting bids specified a piggery disposal plant of 50 tons capacity, investigation demonstrated

TABLE 2. AMOUNT OF OFFAL PRODUCED AT PIGGERIES

City	Garbage Delivered Tons per Day	Lbs. Fed. to Hogs per Day	Number of Hogs	Hog Manure		Reference
				Per Cent of Garbage	Lbs. per Hog	
Baltimore (1920)	33 av.		850	40		Hering & Greeley, p. 259
Buffalo (1920)	60 av.		4,300	30		Hering & Greeley, p. 259
Feb. 21-Mar. 15, '23.....	47.03-75.19	18.4-35.4	4,240-5,272	48.6-60.5	10.2-17.2	M & E Data sheet
Assumptions, M & E.....		40 av.	6,000	50	6†	M & E Report
Newark (1920) (c).....	38 av.		1,210	50		Hering & Greeley, p. 259
Worcester (1920)	30 av.		3,000	65	**	Hering & Greeley, p. 259
(1917)			2,000-3,000		***	Bonnett, News Rec., Aug. 30, 1917
Highland Park (1920).....	15 av.		750	50-57		Hering & Greeley, Hering & Greeley, p. 257
Grand Rapids, Mich.....	36 av.		6,000	10%*		Hering & Greeley, p. 259
Topeka, Kans.			6,000	†		News Rec., Nov. 8, 1917, p. 891
Dist. of Columbia.....						
Exper. Farm			200		(a) (b)	Munic. Jour., Nov. 22, 1919, p. 308

* Unconsumed garbage.

† 2 wagon loads a day of hog offal.

** About 2.5 cu. yds. of hog manure produced daily.

*** 5 cords of cleanings per day.

† Manure and bedding.

(a) During period of rich garbage in winter from 15 to 20 lbs. of the feed per pig is not consumed; increases to 30 pounds in summer.

(b) 6 lbs. per pig daily of droppings.

(c) N. Y. S. D. Bull. No. 19, Jan. 1, 1922, p. 15: 2,000 hogs consume 20 to 30 tons per day. Uneaten garbage collected each morning and delivered as fertilizer.

that the piggery refuse was equivalent to at least 50 per cent of the weight of green garbage, as shown by the data in Table 1.

The quantity of piggery refuse at Buffalo, 54.8 per cent of the green garbage delivered, corresponds moderately well with the percentages of piggery refuse produced in several other cities from which data have been published, as shown by Table 2. This approximate agreement with reference to the quantity of piggery refuse, it will be noted, does not apply equally well to the quantity of garbage delivered per hog. The data do not include quantities of garbage actually fed, which may account for some apparent discrepancies.

The constituents of the refuse at Buffalo are indicated by the results of analyses in Table 3:

TABLE 3. ANALYSES OF PIGGERY REFUSE AT BUFFALO

	March 15, 1922 Per Cent	February 1, 1923 Per Cent
Moisture of Refuse as Collected....	—	75.44
Tankage*		
Grease	12.33	16.34
Ammonia	3.14	3.01
Bone phosphate of lime.....	2.28	8.39
Potash (K ₂ O)	1.15	1.00
Moisture	7.70	7.69

* Refuse after drying

There were two bids for reclaiming the salable products from the green garbage and piggery refuse: one by extraction and drying with solvent, for the utilization of the grease and tankage; the other by drying, utilizing the entire product for fertilizer base.

The former is the Cobwell-Merz process, which, as applied to the green garbage, provided for its partial drying in a direct-heat drier, followed by further dehydration and extraction with solvent. The proposal provided for scrubbing the gases from the direct-heat drier and for their subsequent treatment with chlorine to remove odor. The second stage of the process was to be carried out in closed reducers with very little opportunity for the escape of objectionable gases.

This bidder omitted the predrying in the case of piggery refuse, evidently because of uncertainty as to the success of such treatment and the difficulty of deodorizing these gases, which are believed to be more objectionable than those from the predrying of green garbage.

The other bidder provided drying in re-

ducers and condensation of the gases with water, the residual gases to be passed through the boiler fires.

It was concluded that reduction with solvent was the most advantageous process for the treatment of green garbage and that simple drying was best in the case of the piggery refuse. Estimates of construction cost and annual charges for plants having 200 tons daily capacity are given in Table 4:

TABLE 4. ESTIMATE OF CONSTRUCTION COST AND ANNUAL CHARGES

	Predrying, Dehydrating and Extrac- tion with Sol- vent	Piggery and Drying of Piggery Refuse
Construction cost	\$694,800	\$677,700
Net annual operating cost per ton (40,000 tons per year) profit	\$0.16	\$0.25
Total net annual charges per ton (40,000 tons per year) expense	\$1.42	\$1.03

The diversity of the proposals was so great that it was exceedingly difficult to adjust them to a common basis upon which they could be fairly compared. They were also so seriously lacking in definiteness, details and specifications that the city was advised to reject all of them; to decide which of the several systems of disposal it wished to adopt (for which decision the comparison was adequate), and to then design and properly specify the type of plant desired and take bids thereon.

The investigation developed the fact that a 200-ton plant would be taxed to capacity at about the time it could be completed—a condition likely to lead to unsatisfactory performance in the near future. It was therefore recommended that the plant be enlarged 20 per cent to provide for growth within the next few years and before enlargement of plant could reasonably be expected.

The recommendations of the report were promptly transmitted to the City Council by the Commissioner of Public Works. Hearings were held, at which much opposition to the continuance of a municipal piggery developed. Since that time several hearings have been held upon sites for some kind of disposal plant, and serious opposition has developed in the case of every site suggested.

ACKNOWLEDGMENT.—One of a series of papers prepared for the annual convention of the American Society for Municipal Improvements under the auspices of the Committee on Sewerage, Sanitation and Garbage Disposal.

Lighting a City Viaduct

The Ornamental Street-Lighting Installation on the McLemore Avenue Viaduct, Memphis, Tenn.

By P. Y. Danley

AN interesting example of up-to-date practise in ornamental street lighting is the installation on the recently completed McLemore Avenue viaduct in Memphis. The lighting of a railroad viaduct must be planned with special consideration for such features as the convenience of cleaning glassware, the cost of breakage renewals, and the efficiency of

with a 200-watt, 110-volt lamp. The design of the bracket and pendant harmonizes with the architecture of the viaduct and adds greatly to its appearance by day and night. The pendant fixture is typical of modern thought in street lighting, in that it utilizes a large proportion of the light by means of a system of internal, parabolic reflectors placed above and below the lamp,



THE McLEMORE AVENUE VIADUCT, MEMPHIS, TENN., SHOWING BRACKET TYPE LIGHTING UNITS MOUNTED ON CONCRETE POLES

the unit. A consideration of these matters as well as the ornamental appearance desired led to the adoption of the type of bracket and the fixture shown.

The installation consists of 24 colonial brackets, supporting octagonal Reflecto-Lux pendants, each pendant being equipped

directing the light through glassware of low absorption and confining it to useful directions. By means of such light control, a fairly high intensity is obtained at points midway between units, and a reasonably uniform distribution is secured. Very little light is lost in the upper hemisphere,

where it serves no useful purpose.

The glassware of the lantern consists of eight separate panels of vertically ribbed, clear glass, this particular glass having been selected because, by means of its vertical ribs, a horizontal spread is imparted to the light ray without interfering in any way with the distribution in the vertical plane. The advantage of the panelled glass is obvious: when breakage occurs, only one or, at most, two panels need be replaced, at an approximate cost of 10 cents per panel. This compares very favorably, from the standpoint of maintenance cost, with the well-known type of ornamental unit, which consists of a single piece of glass ranging in cost from \$2 upward, and at the same time it is artistic and distinctive in appearance.

The method of controlling the power supply for the viaduct circuit is of interest, as it is admirably suited to this type of installation. The city streets are lighted by means of the usual high-voltage arc circuit and, while it is desirable that the viaduct lights operate simultaneously with the other city lights, it is not practical to feed them from the high-voltage circuit. The system employed makes it possible to synchronize the bridge lights with the city

lights and at the same time use a low-voltage circuit. A small distribution transformer installed at one end of the viaduct delivers power to the viaduct circuit at 110 volts. The primary of this transformer is controlled by means of a small remote-control oil switch actuated by a solenoid connected in series with the high-voltage arc circuit. When the arc circuit is operating, the switch contacts are held in the closed position and the viaduct circuit is supplied with power. When the arc circuit is dead, the switch contacts open by gravity and the viaduct transformer is disconnected from its 2,300-volt supply. The system operates entirely automatically and with greater accuracy and reliability than is possible with other methods commonly used for this purpose.

The installation as a whole serves as an example of the results that can be accomplished in reduced maintenance cost, efficient utilization of light, and artistic ornamentation of city thoroughfares by close cooperation between city officials and manufacturers. The ornamental units were designed by William B. Fowler, City Engineer, with the cooperation of the Illuminating Engineering Bureau of the Westinghouse companies.

Cost of Operation of Municipal Reduction Plant

Installation of New Dryer Equipment Reduces Cost of Operation

THE total amount of raw garbage received at the municipal reduction plant in Chicago in 1922 aggregated 104,073 tons, an increase of 3,339 tons over the receipts for the preceding year. Because of the installation of new dryer equipment, no garbage grease and very little garbage tankage were produced at the plant during the first five months of the year. From June 1 to December 31 the plant produced 3,118,640 pounds of garbage grease

and 7,192 tons of garbage tankage, the sale of which, together with the revenue derived from the sale of rags, bones, scrap iron, etc., produced the sum of \$136,218. In addition to this amount, the inventory at the end of the year showed garbage grease and tankage to the extent of \$6,660. The expense of operation for the year 1922 amounted to \$660,368.13. The net cost of the plant was therefore \$530,856.63, as compared with a cost of \$669,625.29 in 1921.

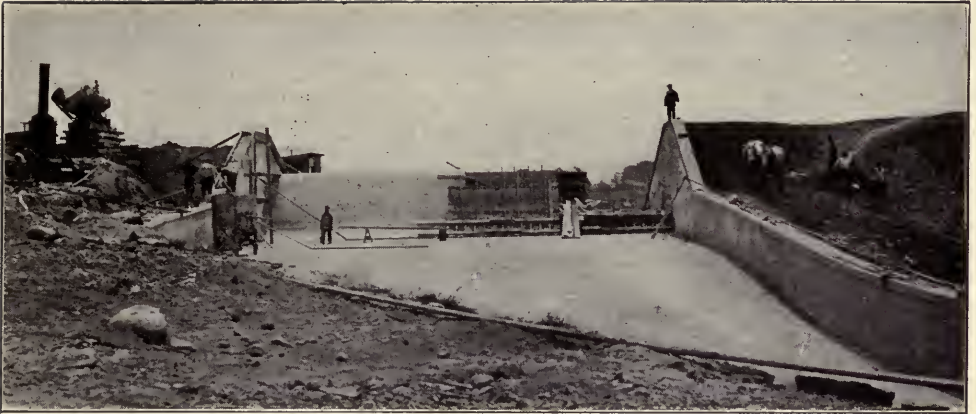
Cost of Road Building Offset by Benefits

EVERY sound financial undertaking must guarantee to those who invest in it some sort of return. To the capitalist, that return comes in the form of interest; to the laborer, it is in the form of wages. While investment in road building does not bring to the taxpayer a return in the form of either interest or wages, it does bring to him certain benefits which, when expressed in value of dollars and cents, are equally as great as, and probably greater than, returns on his other private investments, such as mining and oil stock, that he may eagerly have purchased with the ex-

pectation of somehow becoming wealthy overnight.

A few of the benefits derived from the expenditure of tax money in roads are as follows: decrease in cost of transportation of agricultural and manufactured products; saving of time in traveling from place to place; increase in volume of business created by tourists; increase of property value; and more equitable distribution of taxes throughout the state.

EDITORIAL NOTE.—From a paper read before the Kentucky Highway Engineers' Association by J. T. Madison, Office Engineer, Department of State Roads, Frankfort, Ky.



BUILDING THE 60-FOOT SPILLWAY OF THE ILION DAM
The floor of the flume is paved with one-foot concrete blocks

City of 10,000 Builds \$50,000 Water System

New Ilion Water System to Pay for Itself

By Charles Martel Niles

BELIEVING that an abundant supply of pure water is the best fire and health insurance for a municipality, the Water Commissioners of Ilion, N. Y., are building a great storage reservoir high among the hills south of the village. A

deep ravine is being spanned by an earth and concrete dam 726 feet long and 80 feet high. The dam will form a lake holding 150,000,000 gallons of water, which insures a five months' supply for Ilion's 10,000 inhabitants. The creek which feeds



ONCE DURING THE CONSTRUCTION OF THE ILION DAM A CLOUDBURST SENT SUCH A FLOW OF WATER THROUGH THE GORGE THAT IT THREATENED THE DESTRUCTION OF THE PARTIALLY COMPLETED WORK

the reservoir derives its flow from springs.

The dam is of earth, with a core wall of concrete to prevent seepage. A 60-foot spillway has been provided at the north end to take care of the overflow. The dam was made 404 feet thick at the base to withstand the pressure of 600,000 tons which the impounded water will exert. If it should seem desirable at some future time, the top of the dam can be raised a few feet, thereby doubling the capacity of the reservoir.

The core wall extends through the center of the dam for its entire length. It is set 8 feet into the rocky floor and sides of the gorge. The limestone from the core wall trench was shattered with pavement breakers and removed by hand, as it was feared that blasting might open cracks in the rock, with consequent danger of leakage. The core wall is 5 feet thick at the base, tapering to 2 feet at the top. Boulders averaging a foot in diameter were embedded in the concrete. During construction the

top of the concrete outlet chamber was kept 5 feet below the top of the core wall to take care of flood water, but even this precaution proved inadequate on one occasion, as illustrated.

Eighty-two thousand cubic yards of earth were required to form the great bulk of the dam. Six inches of the old ground surface were removed first to insure a good bond with the new fill. The filling material was obtained from the reservoir basin and from the hillside at each end of the dam. The lower part of the fill was made by the hydraulic method. The material was dumped from motor trucks at the edge of the ravine and a stream of water from a 3-inch pipe was used to wash the material down into the desired location. The upper part of the fill was carted into place, being deposited in layers 6 inches thick, watered and compacted with a heavy grooved-roller.

Earth, small gravel and clay were used for the fill; large stones, sod and débris being rejected. The fill was kept at the same level on both sides of the core wall. The down-stream slope of the dam, which is 2 to 1, is broken by two 10-foot berms. Open drains formed of 18-inch sewer pipe split lengthwise extend along the berms to prevent heavy rains or seepage from washing away the fill. The up-stream face of the dam has a slope of 3 to 1. The upper half of this face will be protected by rip-rap a foot thick.

Two parallel lines of cast-iron pipe resting on a bed of concrete extend through the base of the dam. To prevent leakage, the pipe joints are encased in concrete cut-off walls a foot thick, 7 feet high and 10 feet long. The 36-inch discharge pipe has its intake at the up-stream toe of the dam and empties into the creek below the reservoir. This will make it possible to drain the entire basin when necessary or to relieve the spillway partially in times of flood. The 24-inch feed pipe, which will supply the village, has its intake about half-way up the inner face of the dam. The object of this is to obtain the purer water in the upper part of the basin. The concrete intake chambers are covered with racks made of 2- by 4-inch white oak. The flow of water through the pipes will be controlled by valves in a concrete gate chamber measuring 5 by 8 feet which rises through the center of the dam.



SETTING THE 36-INCH EDDY VALVE ON THE BLOW-OFF AT THE VALVE CHAMBER OF THE NEW DAM OF THE ILION, N. Y., WATER-WORKS



FOUNDATION OF THE GATE-HOUSE, SHOWING CUT-OFF WALLS AROUND JOINTS IN THE CAST IRON PIPE LEADING FROM THE GATE-HOUSE

The crest of the concrete spillway is 6 feet lower than the top of the dam. Below the dam the spillway narrows to a flume 20 feet wide and 5 feet deep, which extends 356 feet along the side of the gorge and discharges over a rocky wall into the creek. The floor of the spillway is paved with large concrete blocks a foot thick, the joints between the blocks being filled with elastic material. The flume has a descent of 33 feet. To break the force and velocity of the rushing water, three hydraulic drops or steps 18 inches high were made in the floor near the lower end.

From the new dam the supply pipe will lead downward to a smaller storage reservoir near the village. The water will be discharged through a group of 70 small nozzles, throwing a spray high into the air. After being aerated, the water will be filtered through 3 feet of selected sand and 8 inches of pea gravel. The sand will be taken out of the filters at regular intervals and washed under pressure. From the filters the water will pass into an underground clear-water basin with a capacity of 500,000 gallons, where it will be safe from contamination until drawn into the mains. The water is tested weekly by an expert chemist. A chlorination plant is kept in readiness to treat the water in case of emergency. The entire system is so constructed that no pumping is necessary.

Upon completion of the new reservoir, the system, which is owned entirely by the village, will have a value of over half a million dollars. It has not cost the taxpayers of Ilion a single penny. Nor will any taxes be necessary to pay for the new reservoir now building. The money was borrowed on the credit of the village, but both principal and interest will be paid from the water revenues. Considerable land has necessarily been acquired for the construction of reservoirs and protection of the watershed. Several thousand trees are planted on this land annually. It is expected that after thirty years the village will derive a handsome revenue from the annual sales of lumber.

Every year, water to the value of \$10,000 is supplied free of charge for fire hydrants, flushing sewers and sprinkling streets; for the village hall, public library, hospital, engine houses, schools, building construction, public fountains, cemeteries and automatic sprinklers in factories. Owners of private property are, of course, charged for the water they consume, but the rates are moderate and the service satisfactory. There is not a single unpaid or uncollected bill on the books of the Water Commission. Careful construction and wise management have given Ilion a good water system which is paying for itself and reducing taxes in the bargain.

The Deadly Grade Crossing

·An Editorial from *The Nation*

AN express train from a popular inland resort to New York is speeding through a region where Nature spreads before the eyes of the passengers one of her finest panoramas of river, mountain, and woodland scenery. Suddenly there is an abrupt jar, almost violent enough to throw down any one who happens to be on his feet. It is followed at a brief interval by another shock, and the train is at a standstill. The call sounds through the cars: "Is there a doctor on board?" But the emergency which prompted the summons is already over. In the middle of the highway a few yards distant lies a twisted mass of metal, from which the train crew extricate the lifeless bodies of a man and a woman who only a few moments ago were in buoyant health and vigor. The corpses are quickly covered by a sheet, from beneath which trickle small streams of blood. The blinds of the dining-car are lowered lest the sight provoke nausea among passengers just sitting down to their midday meal.

From conductors and porters one soon picks up the outline of the story. The road by which the automobile was traveling runs for a considerable distance almost parallel to the railway track, and the train must have been clearly visible to its occupants. But some demon of foolhardiness must have inspired its driver with the ambition of challenging the express to a racing contest. With his own speedometer registering sixty miles an hour might he not hope to reach the crossing ahead of the locomotive? Indeed, he does reach it first, and he almost clears the danger-point—almost, but not quite. The engine strikes the rear wheel of the automobile and hurls the whole machine fifty feet along the highway.

The scene just described is of such poignant tragedy as to haunt even the waking thoughts of the train passengers for many days afterward. The memory of that ghastly heap in the road comes back to them unbidden again and again. But an incident of this kind is so much a commonplace of railway travel nowadays that

it has not even a news value. The next morning it is recorded in the press of the district, but outside that area it finds no mention at all. It lacks that attribute of the exceptional which attracts the attention of the journalistic newsgatherer. It happens to-day in New Hampshire. It will happen to-morrow in New Jersey and the day after in Illinois and so on through the calendar. For every day in the year, on an average, three persons are killed and twelve injured at grade crossings in the United States.

De mortuis—yes, but only the plainest language befits such a mad freak if it is to serve as a warning to the living. There may be rare occasions when a motorist is justified in taking great risks, but it is inconceivable that on a country road with a grade crossing just ahead and a train in actual sight there can be any adequate reason for running an automobile at the speed of a fast express. The line is very thin that separates such conduct from suicide. It might easily bring with it manslaughter also. And all for the satisfaction of a depraved sporting instinct and the saving of a few seconds on a holiday tour through a region so delightful that most travelers would wish to prolong rather than abbreviate their savoring of its charm!

But granted the reasonable obligation to stop, look, and listen when approaching a grade crossing, a heavy responsibility lies upon the railroad companies for permitting the existence of so many points of danger. In England one seldom hears of a grade-crossing accident. The annual toll in the British Isles from this cause is 40 killed and 16 injured, as against 1,259 killed and 4,493 injured in the United States. The difference is not to be explained by our greater railway mileage. The British railways carry over their shorter tracks half as many passengers again as the American, which must mean that the number of their train journeys is much greater in proportion to the length of tracks. The reason of so striking a contrast is obvious to any American visitor

on his first railway or automobile journey in England. He will notice everywhere how the building of bridges has almost eliminated the grade crossing, and how, even where it is allowed to exist, the precaution is taken of providing a gate or bar operated by a neighboring signalman. In the United States, on the other hand, according to an estimate by the American Railway Association, there are no less than 250,000 grade crossings—virtually one for every mile of track. Our railways, more-

over, afford in many places the spectacle of trains running through the streets of a city without the slightest fence to separate them from the ordinary traffic. When he was over here some years ago Arnold Bennett was amazed to see trains making their way in this fashion along the thoroughfares of Syracuse. That city, with a population of over 170,000, can still offer its foreign visitors a spectacle which would seem incredible in Europe, even if presented on a movie film.

What Is Being Done About It?

THE AMERICAN CITY reprints the foregoing editorial from *The Nation* in the hope that the result may be to speed up in some measure the forces now working to reduce, and finally eliminate, tragedies at grade crossings.

The American Railway Association has been endeavoring to impress motorists with the folly of "taking a chance" at railroad crossings. The "Cross Crossings Cautiously" poster, here reproduced, is being used effectively in this educational work, in cooperation with the National Highway Protective Association, automobile associations, churches, schools and many civic bodies.

In New York State a Committee for the Elimination of Grade Crossings has been formed, with Richard H. Lee, President of the Automobile Club of New York, as Chairman. The committee's program calls for the removal of the 8,000 grade crossings in the state at the rate of about 200 a year, the cost being estimated at \$20,000,000 annually.

The *Railway Age*, in its issue of November 3, 1923, published a tabulation of the laws of states and orders of commissions regulating the passage of automobiles across railroads. From this it appears that five states have gone so far as to require

all automobiles (with, in some cases, exceptions) to be stopped before crossing a railroad at grade. But such laws are obviously impossible of general enforcement, and as someone has well said, "Horsepower under the hood is not so important as horse-sense behind the steering wheel."

As *The Nation* says, "A heavy responsibility rests upon the railroad companies for permitting the existence of so many points of danger." But the process of eliminating 250,000 grade crossings throughout the United States will at the best be a very slow one. Among recent articles offering practical suggestions as to what can be done in the meanwhile, a paper on "The Grade Crossing Problem," by A. R. Losh, U. S. District Engineer, in the *North Carolina Highway Bulletin* for October, 1923, is of exceptional value.



The Administration of the Street Pavement Within the Railroad Area

By R. C. Cram

Engineer, Surface Roadway, Brooklyn-Manhattan Transit Corporation

THE electric street railway provides a service which is vital to the community and upon which the comfort, convenience, health and development of the community are dependent. The dependency is mutual, however, since the railway would soon go out of business if it did not perform a needed service of a character which deserved public patronage.

Is the administration of street paving as generally performed by the railways in the car-track areas generally considered by the car rider or by the community as a part of the transportation service? It is doubtful if it is so recognized, as about the only citizens who would miss the railway pavement service are the motorists, bus owners, truck owners and other operators of vehicles generally using the public streets.

How the Duty of Administering Pavements Is Imposed

The theory of government upon which this country has been developed is that the state should refrain from attempting to enter upon business enterprises. This theory resulted in a policy of utilizing private capital and enterprise for the development of most industries which have come to be classed as public utilities. In such manner did the state avoid the problems of development and financing and the particularly difficult problem of the operation of such utilities.

In following that theory or policy, the states have granted franchises to the railways for the conduct of the business of transportation, and the grants of these

franchises have been frequently contingent upon the performance of certain obligations in relation to the assumption of expenses for the construction and maintenance of pavement in the street areas occupied by the railroad track structure. Such an obligation, as before stated, has been considered to be a form of taxation.

It will be seen that, unintentionally perhaps, the railways were thus required also to enter upon and conduct a paving business or service which is entirely foreign to the conduct of the transportation business

proper, and of itself this paving business does not produce any revenue but is, on the other hand, an added operating expense not germane to the main business. It is indeed a liability and not an asset, since the amount of the tax thus imposed may not be determined in advance from year to year with any degree of accuracy.

The Street Railway View-Point

The paving service is performed by the street railway company because it is a duty imposed by the city as an exercise of the taxing power for the benefit of the municipality. The obligation to provide this form of service is a duty which is not dependent upon any conditions that the railway creates, such as interferences with the surface of the streets due to the presence of the tracks. This benefit of the municipality, together with the lesser paving taxes for railway street paving paid by abutting property owners, is had at the expense of the car riders, who equitably should pay only for railway transportation service.

New and Added Conditions Have Arisen

The recent and rapid development of the automobile as a means of transport has greatly increased the liability and expense to the railway for the paving service, and it now happens that the railway must provide the pavement for its competitors, the bus operators, as well as for the private motorists and truck owners to use. These users pay very little for the use of streets in general and nothing for the use of railway pavements. That the bus operators and truck owners have not been paying sufficiently for their use of pavements in general, is shown by the fact that the states

are now seeking to devise a form of taxation which will require such vehicles to more nearly pay for the damage to pavements which they are causing. Meanwhile the railways, as large general taxpayers, are contributing to the up-keep of pavements, not only on the railroad streets, but also upon all streets not having tracks.

In so far as the railway areas are involved, the railways, through the paving obligation, are required to assume a quasi-governmental function which primarily is one belonging to the municipality, or the state, since the municipality is but an agency or creature of the state. The function referred to is that of providing and maintaining the highways or streets.

Divided Responsibility for Pavements

The statutory allocation of the function or duty of providing pavements, between the railway and the municipality, divides the responsibility and renders the administration of pavements more difficult for each of these agencies charged with like duties in the same highways. Divided responsibility for the successful administration of any enterprise leads to confusion and to attempts to shift responsibilities from one party to the other. The extent of the present railway pavement obligation is not a small one, since the railway frequently paves and maintains as much as 56 per cent of the area in streets having tracks within a given municipality, and in some instances the railway pavement area amounts to 10 per cent of the entire paved area within a city. To that extent, the municipality does not have a direct control of the entire pavement administration within its boundaries.

Such a state of affairs may hamper the municipality in the performance of its duty of administering pavements generally, due to the need for coordinating the railway efforts in the general paving program. But the railway is also hindered, since the pavement itself restricts the ability to make repairs to tracks and greatly adds to the cost thereof. The railway may further be hampered by the lack of funds through restriction in the rates of fare, which do not provide sufficient income for diversion to this non-revenue-producing part of its service.

Time to Change the Conditions

It is believed that the time has arrived

for us frankly to admit that the pavement of tracks in no way benefits either the railway or the preponderating portion of the public which it serves. We do not think of requiring any other public utility to assume any burden of pavements as a part of service, although they occupy the streets for gainful purposes of supplying needed services. It is only required that such utilities restore pavements following the construction and enlargement of mains and repairs thereto. That is the only responsibility which should now be required of the railways. We should continue to require them to replace or repair pavements which are removed or which become damaged or out of repair because of the presence or use of the tracks. This is not a very novel proposition, since the state of Connecticut has put an arrangement substantially like this into effect by recent legislative enactment.

What Happens If We Change the Responsibility

Let us assume for the moment that we have changed the railway paving obligation to the extent (1) that railways are not obliged to install original pavements; (2) that they are not required to undertake complete repavements; and (3) that they are obliged only to repair pavements which have become damaged or out of repair as a result of the presence and use of the tracks. If such a condition were to exist, we should still be confronted with certain problems, the principal ones being the construction of tracks which will admit of satisfactory pavement; which will not cause undue deterioration of the pavement therein or in adjacent parts of the street; and the determination of the responsibility for repair of defects where these occur as the result of the existence and use of the tracks.

It is believed that the art or science of track construction has advanced to such an extent that tracks can now be built in streets which will not only permit the installation of satisfactory pavements but also will admit the use of several district types of paving. It is also believed that such tracks, if built under the proper specifications and with expert supervision, will not act detrimentally to the pavement therein during the reasonable life expectancy of the pavement. But it must be remembered that railway streets are usually busy arteries of vehicular

travel and that concentrated vehicular travel, if confined to railway areas by the combination of narrow streets and parked vehicles, will tend to cause excessive and rapid pavement wear. Such wear should not be attributed solely to the presence of tracks.

It is believed that the determination of the responsibility for defects in pavement which are the result of existence and use of the tracks would not prove difficult, if the duty were assigned to engineers who are conversant with tracks and pavements, and means could readily be set up for the settlement of differences of opinion by a third party, representing the public, such as the Public Service Commission.

If the Present Situation Is to Continue

If, on the other hand, the existing statutes governing street railway pavements are to prevail, it means in effect that the railways are to continue as the gatherers of a special and excessive tax from one class of people, the car riders, who must thus contribute to the provision of pavements for the automobiles to use. And if it is to continue, there should be no restriction upon the railway which will prevent passing this tax along to the car rider, just as the increase in the cost of coal is passed on to the householder.

Coordination of Track and Pavement

It will be conceded that the proper administration of pavement within the railroad area is contingent upon the proper coordination of two distinct structures—the track structure and the pavement structure. That such a coordination may obtain, it is necessary that there be a clear understanding of the functions of the two structures. The function of the track structure is primarily that of furnishing a means for the support and passage of railway cars. In this respect the street railway track does not differ from the steam railroad track. In minor respects it may differ, but the principal difference is one of location rather than of structure. The factor of location, generally in streets, imposes several requirements which the steam railroad

track does not have to meet, the principal one of which is that of adaptability to installation of pavements.

The function of the pavement as a structure is primarily that of furnishing a means for the support and passage of vehicular traffic. A pavement is a pavement no matter where located, and its location ordinarily has but little influence upon the design of the pavement structure, excepting when the location happens to be within the confines of, or adjacent to, a track structure. It is only when the factor of location occurs in a combined track and pavement structure that we have any unusual problems arising as to what should be the nature not only of the combined structure, but also of the individual parts which are so combined.

The track naturally is an elastic structure, and when it is to be used in a street and to contain a pavement structure, its elastic qualities require greater control, but it is believed that such control should not be carried to the extent of attempting to provide an absolutely rigid structure. Sufficient rigidity should be provided, however, to prevent movements which will be detrimental to the pavement structure. The pavement structure should be one which will not be unduly influenced by slight vibratory movements, and means for preventing water from damaging either the pavement or the track should be provided.

The most critical attention to details of design and inspection of installation of both track and pavement structure is essential in order to secure the desired combination structure. This extends to the same consideration of the details of the pavement structure for the entire street surface between curb lines, and the railroad streets and pavements should be designed specifically for the railroad traffic. The American Electric Railway Association and the American Society for Municipal Improvements have jointly formulated a specification for tracks in paved streets, which should be of great assistance in securing proper track and track pavements.

ACKNOWLEDGMENT.—Abstract of a paper read before the Governmental Research Conference, Washington, D. C., November 16, 1923, under the auspices of the National Municipal League.

Every community is to be judged by the quality of leadership it will accept.

—James Russell Lowell.

Forward Steps in City and County

Water Company Presents Fire-Fighting Equipment to City

SHELBY, OHIO.—Through the public-spirited generosity of the Shelby Water Company, a few weeks ago, the fire-fighting facilities of Shelby were more than doubled without cost to the city. For the last thirteen years this small city has depended on a single piece of fire apparatus which has given excellent service—an American-LaFrance combination chemical and hose car. It was frequently found, however, that the ordinary pressure in the hydrants was not sufficient to provide the volume of water necessary for the department, and this in turn necessitated boosting up the pressure at the water-works pumping-station. This meant a sudden strain upon the entire distribution system of the city, not only upon the mains, but also upon the individual services, and the plumbing in the buildings.

This handicap has now been overcome by the gift to the city, through President R. P. Bricker of the Shelby Water Company, of a fine triple combination chemical, hose and pumper. This apparatus provides direct pressure at the point where it is most needed—at the scene of the fire—and

it can also pump from any available lake, pond or stream. The new triple combination was built by the Prospect Manufacturing Company, the motive power being a Red Seal Continental engine.

Since the receipt of the combination pumper, the older piece of apparatus has been thoroughly overhauled, and Shelby now has a feeling of exceptional security in case of fire in any part of the city.

W. J. FULTON,
Fire Chief.

Aged Women Have Fine Home Through Cooperation of Women's Clubs and County Supervisors

SAN BERNARDINO, CALIF.—The Monte Vista Home for Aged Women has been established in San Bernardino through the cooperation of the San Bernardino County Federation of Women's Clubs and the County Board of Supervisors. The need for some means of caring for the dependent aged women in the county has been realized for some time, but no adequate provision has ever been made for this particular work by the state or county charity organizations. When the matter came to the attention of the County Federation of Women's Clubs, the members decided to at-



THE OLD AND THE NEW TRUCK OF THE FIRE DEPARTMENT OF SHELBY, OHIO



THE MONTE VISTA HOME FOR AGED WOMEN, BERNARDINO, CALIF.

tempt to solve the problem. A committee representing the various clubs attended a meeting of the Board of Supervisors and made the proposition that if the Board would build a suitable home and provide for its up-keep, the club members would furnish it, each club undertaking the care of a single room or section of the building. This proposal met with the approval of the Board, and a home large enough to accommodate fifty persons was constructed and is now in operation.

The occupants of the home, who must be residents of San Bernardino County, are for the most part pioneers—women who have spent the best years of their lives in helping to build up this section of the country, and who through some misfortune are now in need of help and maintenance. If any woman admitted to the Monte Vista Home possesses a small personal fund, the money is placed in a trust fund for the Home, but this is rarely the case, since the Home is primarily intended for those who are absolutely dependent.

The furnishings provided by the women's clubs are all new and up to a certain standard set by the County Welfare Board. The living-room, which is exceptionally attractive, was furnished by the women members of the Catholic, Christian Science, Presbyterian, Methodist and Unitarian societies. The clubs, in addition to furnishing the rooms, consider the occupants of their respective rooms as their wards and do everything possible to make the women comfortable and happy.

NELLIE WESTLAND SUESS.
President, San Bernardino County Welfare Board.

A Fountain That Became a Traffic Guide

OTTAWA, ILL.—An abandoned fountain owned by the city of Ottawa has been transformed into the unusual type of traffic guide shown in the accompanying illustrations. This fountain was donated to the city a number of years ago, at a time when automobiles were somewhat of a curiosity, and served as a watering-trough on one of



ONCE A FOUNTAIN. NOW A TRAFFIC GUIDE,
OTTAWA, ILL.



Photographs by W. L. Grover, Ottawa, Ill.

WHERE THE TRAFFIC GUIDE STANDS, ON THE BOULEVARD

and the lower side lights red. It now stands as an ornamental traffic warning at the head of one of the boulevards of the city. Previous to the erection of this new guide the approach to the boulevard was considered a dangerous one, as there were no lights whatsoever on this particular corner. The idea was original with Harry Bellrose, Commissioner of Water and Lights of this city, and was carried out under his supervision.

F. A. BOYLE,
Superintendent of Streets.

the prominent streets of Ottawa. Within recent years, however, the need for a watering-trough gave place to the demand for "free air" stations, and the fountain was finally dismantled and abandoned.

To-day the fountain is again occupying a position of usefulness—though not, it is true, the one for which it was originally intended. It has been wired for electricity and lights have been installed. The top light is white, the upper side lights green,

***The First Capital of Texas
Celebrates Its Centennial***

COLUMBUS, TEXAS.—The one hundredth anniversary of the founding of Columbus, the first capital of Texas, was recently celebrated by an elaborate program of festivities, including one of the most brilliant pageants ever staged by so small a community in the state.

The centennial celebration was formally opened at noon upon the arrival of Gov-



COLUMBUS, THE FIRST CAPITAL OF TEXAS, AS IT NOW APPEARS

ernor Neff and his party, who were welcomed by a salute from seventeen guns fired by a detachment of the United States Army brought to Columbus to take part in the event. Later in the afternoon over two thousand people gathered in the courtyard to hear addresses by the Governor and other prominent visitors. Between the addresses, exhibition drills were given by the Arabia Shrine Patrol—the patrol which recently drilled before the President and won the distinction of being the best drilled patrol in the country. In the evening the throng assembled in the park, where tables were laid with a plentiful repast. Then followed the pageant, "Conquering the Wilderness," which depicted the high lights of Texas history under six flags, from the landing of La Salle in 1685 to the return of peace after the World War in 1918. An audience of between five and six thousand people were seated on the grand stand, which had been erected for the occasion.

As a prelude to the pageant, at the sound of a bugle, the cover of an immense book labeled "Texas History" opened, and out of it stepped a maiden representing the "Spirit of Texas," who introduced the theme. The

pageant required a cast of more than 500 characters and was presented on a stage 210 feet in length and 175 feet in depth. In the final scene the complete cast assembled on the stage, and the celebration closed with the singing of "America" by the entire assembly.

B. H. FABER,
County Engineer.

Fire Fighters Not Daunted by Exposure and Danger

DAVENPORT, IOWA.—While prompt and efficient response to fire alarms, regardless of weather conditions, is expected of every fire department, the readers of THE AMERICAN CITY may be interested in the accompanying pictures of a fire which entailed more than ordinary exposure and danger.

This fire last winter at the First National Bank building in Davenport was started by the short circuiting of electric wires on the second floor. The building having a frame interior, the fire traveled rapidly up inside the walls to the attic and then mushroomed, and was not discovered until it went through the roof at 1 A. M. The wind was blowing about 22 to 25 miles an hour at



MOTOR EQUIPMENT THAT SUCCESSFULLY FOUGHT IN ZERO TEMPERATURE THE FIRST NATIONAL BANK BUILDING FIRE, DAVENPORT, IOWA



ICE-COVERED BANK BUILDING, DAVENPORT, IOWA, AFTER THE FIRE

the time. Thirty-five firemen were soon at work, with three pumps supplying water to two turret pipes and four lines of hose, two lines being used on the outside and two running up the stairways on the inside. By fast work the firemen succeeded in preventing the fire from spreading to any of the surrounding buildings. The total loss to the bank building and contents amounted to but \$45,000, a large percentage of which was due to damage by water.

In commenting on the credit due the men of the fire-fighting force in responding faithfully to alarms regardless of temperature and weather, *The Mack Bulldog* said in a recent issue:

"It is seldom that the men engaged in fire-fighting service have had to endure such exposure and danger as prevailed at the first National Bank fire in Davenport, Iowa. On this occasion the elements seemed to have conspired to do their utmost to overcome the efforts of mere man. Fire and zero temperature, the unholy allies, were for a time masters of the situation, but in the end the old fighting spirit, backed by modern equipment, was able to crawl up on top of the situation and hold its position.

"To those thoughtless souls who say 'pretty soft' when they see the fireman tilted back in his easy chair against the engine house door-sill, shirt sleeves rolled to the elbow, apparently intent upon nothing in particular, or perchance see him playing the strenuous game of handball in an effort to keep physically fit and at the same time thoroughly enjoying the keen competition of the game, it is suggested that some winter night, as a pastime when the icy

wind is beating the sleet against the window-pane with cutting force, the critic spring from between his warm blankets, jump into his clothes, and rush out into the night at the sound of the alarm prepared to meet any emergency."

PETER DENGEL,
Chief of Davenport Fire Department.

Community Control of Local Coal Supply

HUNTINGTON, UTAH.—In the last two years of its existence, the Huntington Coal Association has amply proved the advantages of organization to the citizens of a community. The Association was formed in the fall of 1921, when a lease was secured from the Federal Government on a small unit of coal land which the citizens of the town wished to operate as a community coal mine. The lease as granted constitutes, so far as known, the first and only one of its kind ever issued by the United States Government. It is optional for a period of twenty-five years, the provisions of the permit requiring its renewal biennially. This concession can be maintained as long as the stipulated conditions are complied with. These are not rigid, but very liberal. The operation of the mine must be in accordance with Federal laws regulating the operation of mining properties—looking to the safety of the miners, the elimination of inefficient mining methods, etc. It has been approved by the state coal mine inspector.

The mine must be operated on a non-commercial, non-profit basis; its sole purpose being to provide fuel for domestic use at the minimum cost, no charge to be made above that needed for the actual operation of the property. By this provision, hundreds of dollars have been saved to retail buyers, besides giving them the advantage of controlling their own fuel supply.

A few figures are submitted to show what a saving has been effected by this community enterprise: The first year 824 tons of coal were sold at \$2 per ton, cutting the price formerly paid at company mines by half, the established charge having been \$4. The second year 778 tons were sold at \$2.50 per ton; and for the first six weeks of the present season, beginning September 19, the sales were 250 tons at \$2.50 per ton. Thus, over \$3,000 has been saved to the 178 members of the Association in a little more than two operating seasons,

which includes, for full-time capacity, only the six coldest months. Should business continue in the present ratio, this season's output will approximate 1,000 tons.

Membership, production, and sales are constantly on the increase, and if expectations are realized, most of the Association's financial obligations will have been eliminated at the end of the present coal season. The biggest part of this debt is owed to individual members for contributed labor and material, representing the initial cost of putting the property in operation. These claims, of varying amounts, are being liquidated periodically, as treasury funds permit, in the form of cash dividends.

The Association is therefore nearing a debt-free basis and when unencumbered it will be in a position to sell its members coal at a much lower cost than has been possible heretofore. The mine is equipped with every facility contributing to the highest efficiency and economy of operation, and with these improvements as assets, representing a total expenditure of approximately \$7,000, the Association will be able to reduce the retail coal price to the mere cost of digging and maintenance. With the mine's present up-to-date methods, this averages a little more than \$1 per ton, the balance of the purchasing price being used to place the property in a condition of high-operative efficiency.

The Association is fortunate in the mine's location, which is about 100 feet up from the canyon bottom, just high enough to permit of an excellent loading chute. Therefore no expensive tippie or tramway structures were necessary for the operation of the property. Furthermore, the short 12-mile distance from town makes one-day haulage trips easy, with the consequent elimination of the usual transportation and reload charges.

LAMONT JOHNSON,
Secretary, Huntington Commercial Club.

Metropolitan Planning in Minnesota

ST. PAUL, MINN.—Plans are now under way for the organization of a Metropolitan Planning Commission to provide for the orderly physical development of St. Paul, Minneapolis and the areas surrounding these two cities.

The first steps towards the organization of this Metropolitan Planning Commission were taken by the Northwestern Section of the American Society of Civil Engineers. At a dinner meeting last September this body presented the need for a regional planning commission to a group of citizens composed of the presidents of the civic and commercial associations of St. Paul and Minneapolis; the chairmen of the city and county planning boards; chairmen of the local sections of the Institute of Architects, and the presidents of the local real estate boards. The idea was very favorably received, and in December a meeting was held of duly elected delegates from each of the organizations represented at the previous meeting. This resulted in the formation of two committees, one to determine the form or organization for the proposed Metropolitan Planning Commission and the other to make a study of the region and report back on a tentative boundary line for the Metropolitan District.

The present plan is to appoint a self-organized Metropolitan Planning Commission, and later to take steps towards securing a state enabling act to legalize the body.

Some of the problems which the proposed Commission expects to handle are sewage disposal; joint garbage disposal for the two cities; conservation of the lakes and control of drainage within the Metropolitan District; a study of the future water-supply; extension of the present park system, forest preserves, etc., and a study of the transportation systems.

GEORGE H. HERROLD, Acting Chairman,
Metropolitan Planning Commission.

INDEXES TO THE AMERICAN CITY

The attention of readers is called to the new method of indexing recently adopted, by which the contents of the magazine are indexed by subject classifications each month—a more convenient method for ready reference than the usual table of contents. This monthly index appears on the right-hand page immediately preceding the first page of reading in each issue.

There is also published in January and July of each year a Semi-Annual Index of eight pages, in which all articles published in THE AMERICAN CITY during the preceding six months are classified by subjects, cities and authors. A copy of this index will be mailed free of charge to any subscriber on application.

County Adopts "Pay-as-You-Pave" Policy

Many Advantages Claimed for This Method of Financing Concrete Roads

THE first and major advantage claimed for the "pay-as-you-pave" plan is that it reduces the cost of construction of concrete roads at least 50 per cent. Concrete roads in California cost about \$25,000 a mile cash, or, if built by a 40-year, 5 per cent bond issue, \$51,275 per mile. This method of paying for roads is receiving a three-year trial in San Diego County, Calif., which is paving ten miles of roads each year for three years to try out the scheme which was devised by George Heston, County Treasurer. Since the adoption of this plan early in 1923, the Poway Grade Highway has been completed and the plan has been found to work exactly as predicted.

Saving Interest on Bonds

According to an outline of the system in the *Christian Science Monitor*, the plan is based on the conclusion that it is better business to increase the tax rates for the purpose of obtaining funds for highway building than to increase the taxes for interest on a paving bond issue, since the ultimate cost of the improvement under the increased tax rates will be approximately one-half of that under the bond issue. This tax rate also takes care of the maintenance of the highways when they are paved. The bond issue does not do this. The Heston plan releases future generations from the burden of paying for bonds the receipts of which were used for building roads that have been worn out and rebuilt by the time the bonds are paid.

San Diego County, outside the corporate limits of the city, has 174.4 miles of paved roads, with 57 miles more to be completed under present plans. Approximately 30 miles will be paved and paid for in three years under the Heston plan. By using longer units of time—say 5, 10 or 15 years—the cost a mile can be further reduced by uniform construction of 10, 20, 30, or any other fixed number of miles a year. The Poway Grade, 30 miles northeast of San Diego city, is the first section to be

built under the "pay-as-you-pave" plan. It is of 5-inch concrete in the center, with 8 inches on the side, so as to withstand heavy traffic along the edges of the road. The highway is 20 feet wide, and is in every way standard, yet it cost, complete and paid for, only \$25,000 a mile, compared with \$51,275 a mile, the cost of other similarly paved highways, built under the bond issue plan in San Diego and other counties.

San Diego, like all other California counties, receives annually a share of the fees paid into the state for automobile licenses. In this instance, the county's income from these fees last year was \$125,000 and it is increasing every year. Twenty cents in the tax rate for roads, the figure decided on by the Supervisors, will raise \$160,000, making a total of \$285,000 a year with which to pay for the highways as paved. Out of this, the Supervisors are allowed \$35,000 a year for maintenance, and have placed the cost of paving at \$25,000 a mile, the admitted net cost under the bond issue plan, but not the total cost, as will be shown in a moment. At this figure the \$250,000 remaining in the fund after the \$35,000 for maintenance has been deducted, will pay for 10 miles of the best improved and paved highway a year—and the highway will be paid for at the end of the year. Five years of this means 50 miles of paved highway, paid in full, and with its maintenance paid for as well.

Before adopting this new and revolutionary method of road financing, the Board of Supervisors worked out the following comparative table of costs of 50 miles of paved highway under the bond issue plan and under the Heston "pay-as-you-pave" plan:

BOND-ISSUE METHOD			
Cost of 50 miles of paved roads under the bond-issue plan, the \$1,250,000 bonds to run 40 years at 5 per cent, the usual rate:			
Year	Principal	Interest	Tax Rate
First	\$31,250	\$62,500	12½c.
Second	31,250	60,937	12½
Third	31,250	59,375	10
Fourth	31,250	57,813	10
Fifth	31,250	56,250	10
	156,250	296,875	

End of 40 years	1,093,750	996,875
	1,250,000	1,293,750
Principal	\$1,250,000	
Interest	1,293,750	
Election	20,000	
Total cost	\$2,563,750	
Fifty miles, cost a mile.....	\$51,275	
Maintenance extra		

"PAY-AS-YOU-PAVE" METHOD

Cost a mile of paved road under the "pay-as-you-pave" plan, including maintenance:

Source	Income	Tax Rate
First year auto tax.....	\$125,000	
First year direct tax.....	160,000	20c.
Second year auto tax.....	125,000	
Second year direct tax.....	160,000	20
Third year auto tax.....	135,000	
Third year direct tax.....	150,000	18
Fourth year auto tax.....	135,000	
Fourth year direct tax.....	150,000	18
Fifth year auto tax.....	150,000	
Fifth year direct tax.....	135,000	17
	\$1,425,000	
Less maintenance	175,000	
Total cost	\$1,250,000	
Fifty miles, cost a mile.....	\$25,000	
Maintenance included		

These two tables, which have been proved to be accurate, in practise as well as in theory, give the taxpayer, whether he be in San Diego County or elsewhere, something to think about. Instead of ultimately paying out more than \$50,000 a mile for his highway, he is paying \$25,000 and paying it right now, with an actual maximum increase in his tax rate over the bond-issue rate of $7\frac{1}{2}$ cents. It will be noted that on the bond-issue side of the above comparison more money is paid out for interest on the bonds than in actual highway build-

ing. That is to say, for every dollar which the taxpayer puts into road building, he also takes \$1.05 out of his pocket and hands it over for interest and for the cost of the election whereby he voted himself into a debt whose interest is greater than its principal.

San Diego County has a road problem somewhat different from those of the other counties of California, since a part of these roads are built or will be built through the barren desert connecting the fertile Imperial Valley with the coast; part through the mountains, part through rolling hills, part in sloping valleys, and part on the sandy foundation of the immediate shore of the sea, where the cost of permanent, adequate construction is higher than in other sections.

Construction tests have proved, however, that the average cost throughout the county will be \$25,000 a mile for paved highway, 20 feet wide, concrete 5 inches thick in the center and 8 inches on the edges. On the desert, where the subsoil is hard and building materials plentiful, and in the mountains, where the road often follows the bed-rock for many miles, the cost will be considerably below this average figure, while in the rolling foothills and the valleys it will about maintain the average, so that paved highways throughout the county may be built at this rate.

NOTE.—The front cover of this issue of THE AMERICAN CITY MAGAZINE shows one of San Diego County's "paved-and-paid-for" roads.

Force Account Paving in St. Paul, Minn., During 1922

THE Annual Report of William J. Peter, Commissioner of Public Works, St. Paul, Minn., for the year ending December 31, 1922, contains some detailed figures on paving laid by force account during that year which are of particular interest.

In the paving of Hague Avenue from Lexington to Syndicate Avenues, a 5-inch concrete foundation was laid with a 3-inch asphalt wearing surface. The road was 30 feet wide and 1,956 feet long. The cost of cement was \$2.60 per barrel; sand, \$1.50 per cubic yard; broken stone, \$2.60 per cubic yard; asphaltic cement, \$19.95 per ton; fine sand, \$1.80 per cubic yard, and binder stone, \$2.47 per ton. The cost of preparing the road-bed was 31.59 cents per square yard; the concrete foundation cost \$1.0723 per square yard; the wearing surface, 93.82 cents per square yard; miscellaneous expenses, 33.37 cents per square yard; making the net cost of the paving \$2.66 per square yard, or a total of \$17,990.56. Additional items were: \$404.68 for drainage; \$533.27 for concrete

curb; \$906.52 for water and sewer connections; making the total cost of the job \$19,835.03.

Asphaltic concrete was laid on Otis Avenue from Marshall to Dayton Avenues, where a dirt foundation was removed and a 5-inch concrete foundation laid with a 3-inch wearing surface of asphaltic concrete. The street was 30 feet wide and 535 feet long. The cost for foundation materials on this job was: cement, \$3.15 per barrel; sand, \$1.50 per cubic yard; broken stone, \$2.60 per cubic yard; gravel, \$2.85 per cubic yard. The asphaltic cement for the wearing surface cost \$22.00 per ton, the trap rock \$2.47 per cubic yard, and limestone dust \$5.13 per ton. The cost per square yard for preparing the road-bed was 46.83 cents; concrete foundation, \$1.2933; wearing surface, \$1.0168; miscellaneous charges, 53.13 cents; net cost, \$3.3097; making the cost of the paving \$5,880.01. Additional items were: \$108.80 for drainage; \$824.21 for the concrete curb; \$1,076.86 for water and sewer connections; making the total cost of the job \$7,889.88.



THE MAIN SEWAGE TREATMENT PLANT AT ROCHESTER, KNOWN AS THE IRONDEQUOIT PLANT

The Sewage Treatment Plants of Rochester, New York

By John F. Skinner

Deputy City Engineer, Rochester, N. Y.

THE city of Rochester is served effectively by three sewage treatment plants, known as the Irondequoit or main sewage disposal plant, the Charlotte plant, and the Brighton plant. Each of these has features of particular interest and will be described separately.

The Irondequoit Plant

This plant was constructed in 1915-1917 and at present receives the combined sewage of about 12,200 acres of territory with a population of approximately 250,000. The territory may be increased so that the population ultimately served may become 400,000. There is ample room for enlarging the plant to handle this ultimate contributory population.

The plant consists of coarse racks or screens, detritus chambers, mechanically operated Reinsch-Wurl screens, Imhoff tanks and sludge beds, and a power-house operated by the effluent of the tanks under a 45-foot head. A 66-inch lock-bar steel effluent pipe about 9,000 feet long terminates 7,000 feet from the shore in 50 feet of water at a submerged crib in Lake Ontario. The coarse screens are placed where the intercepting sewer enters the detritus chambers. These consist of flat steel bars $\frac{3}{8}$ -inch thick spaced $3\frac{1}{2}$ inches in centers. There are six parallel detritus chambers controlled by sluice-gates. Each chamber is 90 feet long and 10 feet wide, with a flat bottom 3 feet below the inlet

of the inlet sewer. One or two of these chambers are normally used, but four are put into service during storms.

Grit builds up in these chambers to about 3 feet in depth, beginning near the up-stream end. When a chamber is filled to the down-stream end, the flow is shifted to another chamber and the grit is removed by a clam-shell dredge without dewatering the chamber.

Down-stream from the detritus chambers are emplacements for six Reinsch-Wurl screens. Four of these have been installed. The screen discs are 12 feet in diameter and inclined 30 degrees to the horizontal. The installation is overhung from a bridge, so that there are no submerged bearings. Two screens have slots $\frac{1}{8} \times 2$ inches, and one has slots $\frac{1}{16} \times 2$ inches formed by slotting bronze plates. The fourth screen has recently been equipped with steel plates with $\frac{1}{8}$ -inch circular perforations. Screenings are brushed automatically from the plates to a belt conveyor, whence they drop into an industrial railway car.

Beyond the screen house two influent channels are provided, one of which conducts the screened sewage to the ten Imhoff tanks now installed. The other channel is provided for future similar installation on the other side. Parallel to the influent channels and outside of them are the effluent channels, which receive the discharge from the Imhoff tanks.

The Imhoff tanks may eventually be



THE CHARLOTTE SEWAGE DISPOSAL PLANT AT ROCHESTER

twenty in number. Ten were originally built in five separate units. Each tank is rectangular in plan, 35 x 116 feet, with total depth of 40 feet. The depth of water is about 34 feet. There are three sludge hoppers 35 feet square in each tank. Sludge space above the hopper and below a plane 2 feet beneath the slots amounts to 2 cubic feet per capita for 20,000 people per tank.

The settling chambers, of which there are two to each tank, are 10 feet wide and 10 feet 6 inches deep from the water surface to the slots. There are three gas slots, the center one 3 feet 6 inches wide, and those on the sides 2 feet 6 inches wide. The flow through the tanks is reversed by operating sluice-gates in the influent and effluent connecting channels. An 8-inch sludge pipe from the bottom of each hopper permits the discharge of sludge under about a 6-foot head into a round-bottom open channel extending the length of the tank in the center of each double unit. This channel is continued beyond the tank, across four lines of sludge beds with gates on each side, so that each channel may serve eight sludge beds.

There are 40 sludge beds, 44 feet square, underdrained and arranged in four parallel rows. The sludge is removed and transported in industrial railway cars operating in two subways between the rows of beds. An electric gantry crane spans the sub-

way in which the cars run. In the removal of the sludge this crane raises the body of the industrial car from its truck and places it upon the bed. The dried sludge is then shoveled into the car with stone forks, after which the loaded body is replaced by the crane, and the train of cars is hauled out by a storage battery locomotive.

Upon leaving the effluent channel from the Imhoff tanks, a portion of the effluent passes through a 48-inch lock-bar steel pipe to the power-house, where two 75-kilowatt hydroelectric units generate power for lighting, for the operation of the gantry crane, and for supplying the charging board for the storage battery locomotives. Surplus effluent not required for the power-house overflows into the 66-inch lock-bar steel pipe, which also receives the tail water from the wheels, and is then conducted to Lake Ontario.

The Charlotte Plant

This plant serves a territory of 693 acres with a possible addition of 269 acres, making an ultimate territory of 962 acres, of which about 800 are habitable. The population consists of the inhabitants of the former village of Charlotte with its permanent population of merchants and retired farmers, together with the employees of the railroad and iron works and a few fishermen and sailors. There is also an outlying garden district, and the lake shore

is lined with cottages which shelter a considerable summer population. As this property is being improved, many of the summer cottages are being adapted to year-round residence and, as the territory builds up, the proportion of vacant houses in the winter will decrease.

There is, in addition to the above population, the "Infants' Summer Hospital" with 60 or 70 beds and an equal number of adults comprising the staff and employees. Its season is from June 15 to October 1. During the summer season there is an irregular transient population fed by the New York Central Railroad, boats on Lake Ontario, including excursions from Canada, a continuous procession of automobiles and two trolley lines from the center of the city. These trolley lines have been known to bring 12,000 people to the beach in an afternoon. The present winter population is about 3,000, and the permanent summer population about 4,000. The plant has been designed to operate at from 30 to 180 cubic feet per minute. There are two storm-water overflows, and 48 surface sewers are now connected with the sanitary system. These are being disconnected as storm-water sewers are being constructed. In June, 1919, when the report accompanying the design was submitted, there were 572 house connections to the sanitary

sewers, 314 of which also carried storm water. It is intended to separate these as storm-water sewers are constructed.

The disposal plant is located on a lot 132 feet wide and 275 feet deep on the Genesee River and is bounded on two sides by the New York Central Railroad and on the fourth side by the U. S. Lighthouse property. The plant consists of grit chambers, fine screens, an Imhoff tank and sludge-drying beds. Sewage is received from two 12-inch sewers from the north and south at the west end of the operating house about 12 feet below ground. It passes through one of two parallel grit chambers 4 feet wide and 40 feet long, each of which is followed by a cast iron rack with bars spaced 1 1/16-inch apart set at a slope of 3 horizontal to 4 vertical and then by a Cippoletti measuring weir with a crest 12 inches long. From this point the sewage passes to an air lift well 20 feet deep, from which it is raised to the Imhoff tank with a water surface about the level of the ground.

A neat operating house 18 by 30 feet inside constructed of tapestry brick lined with sand-lime brick and roofed with red concrete tile, houses the machinery, gages, etc., and serves as an office.

Air is provided for the air lift by three No. 1 Nash Hytor compressors direct-con-



THE SEWAGE DISPOSAL PLANT FOR THE BRIGHTON SECTION OF ROCHESTER

nected to 10-horse-power constant-speed motors and feeding into a common header. No air dryer or air receiver is provided. A 6-inch and a 7-inch air lift furnish the necessary variations in capacity.

The Imhoff tank is circular, 38 feet inside diameter, 36 feet 6 inches depth over-all, 30 feet 6 inches total depth of water. There is 2 feet free-board at the periphery and 3 feet at the central gas well, in which the water surface has a diameter of 9 feet 6 inches. The ratio of area of the gas well to that of the settling chamber is 6.75 per cent. The flow is semi-circumferential. The volume of the settling chamber at low-water flow is 10,284 cubic feet. The sludge capacity below the slots is 11,531 cubic feet, and the sludge capacity provided for 10,000 population is 1.153 cubic feet per capita.

The sludge is lifted by air through a vertical 8-inch pipe in the center of the tank. Gates at the top divert the sludge, which only has to be raised against a 2-foot head to either side of the tank to two annular sludge beds 10 feet wide concentric with the tank.

The effluent is discharged directly to the Genessee River one mile from its mouth, through a 15-inch submerged outlet pipe.

The river at this point has a channel 24 feet deep and is the outlet of 2,200 square miles of watershed. In the last 7 miles it has falls amounting to 260 feet, so that it is naturally well saturated with oxygen.

This plant was put into operation in October, 1921, the tank being seeded from the Irondequoit plant the following month. The plant was designed by the writer and constructed by N. A. Brown, Special Assistant Engineer, under the general supervision of the City Engineer. The general contract was executed by Whitmore, Rauber and Vicinus of Rochester, N. Y., and the mechanical and electrical equipment by the O'Connell Electric Company.

The Brighton Plant

The Brighton plant was constructed in 1915-1916. At present it receives the sanitary sewage from about 1,000 acres having a population of between 8,000 and 9,000. The territory may be doubled and the population ultimately become 60,000. The plant at present is completely built for 15,000 people and in part for 30,000. There is room for enlargement to handle the ultimate tributary population. The plant consists of grit chambers, fine racks, operating house,

IMHOFF TANK DATA—BRIGHTON PLANT

Extreme length of settling channel.....	62.5 feet
Width of settling channel.....	24 feet
Cross-section of settling channel.....	340 square feet
Contents of settling channel.....	20,400 cubic feet
Depth of sewage in tank.....	34 feet
Sludge capacity (below plane 3 feet beneath the slots and not including bottom cones)...	18,029 cubic feet
Area of gas vents compared with settling-channel.....	12.9 per cent

SPRINKLING FILTER DATA

Two filters, each $\frac{1}{2}$ -acre	
Depth of stone, 6 feet	
Slope of beds, 0.005 lateral in the direction of the distributing pipes	
Slope of beds, 0.005 longitudinal in the direction of the underdrains	
Sprinkler heads spaced 14 feet 4 inches, in triangles	
Number of sprinklers, 226 per acre	
Head on sprinklers, zero to 6 feet	
Discharge of each dosing siphon, 20 inches in diameter, is into a tapered tank whose bottom is level with highest sprinkler.	
Sprinklers discharge 12.29 gallons per minute with 4.1 feet head.	

FINAL SEDIMENTATION BASIN DATA

Two basins, each containing 78,585 gallons	
Depth, 2 feet to 4 feet	
Influent pipe, 16-inch cast iron, used as a penstock	
Sewage under 75-foot head operates 36-inch Pelton wheel for electric power by which plant is lighted and pump operated.	
Effluent discharges through two 12-inch pipes across a marsh to Irondequoit River $\frac{3}{4}$ -mile above its outlet into Irondequoit Bay, an arm of Lake Ontario.	
Area of site, 22 acres	

COST OF PLANT CONSTRUCTED IN 1915-1916

Site, piping, etc.	\$28,708.26
Screen house and grit chambers.....	6,164.34
Imhoff tank, sludge beds and operating house.....	19,498.63
Dosing device, sprinkling filters and settling basins.....	57,819.44
Power development and electrical equipment.....	5,312.63
Laboratory equipment	1,472.86
Engineering inspection on last two items.....	474.98

Total	\$119,451.14
Approximate annual operating cost	\$5,000

Imhoff tank, sludge beds, dosing siphons, sprinkling filters and final settling basins and is at present handling a little over 1,000,000 gallons per day.

After passing the grit chambers and racks and down the penstock to the operating house, the sewage is clarified by passing through an Imhoff tank, from which about 500 cubic yards of sludge is removed per year. During 1922, 97.2 per cent of the settling solids and 60 per cent of the suspended solids were removed by the Imhoff tank. The ultimate removal of suspended solids by the complete action of the plant averaged 91.9 per cent.

After passing through the Imhoff tank the sewage is oxidized by passing through the trickling filter upon which it is sprayed, the effluent being settled in the final settling basins.

This was the first one of the municipal sewage plants to be completed. Its successful operation, dating from March 1, 1916, has justified the design of the plant, which

has been intelligently operated under expert technical control, so that its effluent is clear and stable for upwards of 21 days at all times. Moreover, the effluent contains less suspended solids and more oxygen than the waters of Irondequoit creek into which it flows.

The plant has been visited by a great many engineers, sanitarians and municipal officials, who have expressed their admiration of its novel details, its neat appearance and its excellent accomplishment. The site has been landscaped by the Park Department and is a popular picnic resort. It is very attractive during the summer, for the plant is surrounded by prairie roses. The winding drive leading down the hill from the end of Tryon Park, with the vista of the blue waters of the bay a mile to the north through the trees, combined with the masses of shrubbery on one side of the drive and the riot of pink blossoms on the other, presents a picture which has been enthusiastically praised.

How Privately Owned Water-Meters May Be Acquired

An Outline of the Methods for Making Meters the Property of the Water Department or Company

THE question has frequently been raised as to how water-meters which have been purchased by property owners may be acquired by the water plant by which such owners are served. Quite a number of municipal and private water plants formerly required their customers to purchase water-meters, either directly or through local supply dealers, and later found that it is to the advantage of the water department or company either to furnish meters free or to maintain those purchased by the consumer without charge, except in cases of malicious damage or damage by frost or hot water. This free maintenance can, in practically all cases, be better maintained by the company or department supplying the water, inasmuch as it usually has a repair shop for its own meters and for other purposes and can do the work at much less cost to the consumer than if the consumer is obliged to have a plumber remove the meter, forward it to the maker and pay freight or express

charges in addition to charges for the repair and the plumber's services.

How to obtain ownership of consumers' meters without purchasing them outright from the consumer has always been a somewhat difficult problem to solve. Some water plants have purchased the consumers' meters by allowing them a credit on water bills until the appraised value of the meter has been refunded, while others have simply guaranteed maintenance of the meters if they are turned over free of cost to the city or the water company. For the latter arrangement, the following contract form has been suggested by the *Water Works Journal* as useful:

AGREEMENT

Contract No.

Service No.

This agreement made and entered into this day of, 1923, by and between (customer) Party of the First Part and the city or Water Company of, Party of the Second Part,

WITNESSETH:

That for and in consideration of the Party of the Second Part keeping in repair and maintaining the water-meter now belonging to the Party of the First Part, except in case of malicious, frost or hot water damage, and located at Street in the city of, the Party of the First Part does hereby assign and deliver to the Party of the Second Part the water-meter at the above location, together with the meter tile and cover, the curb cock, and the pipe fittings and connections therewith.

Signed
Customer

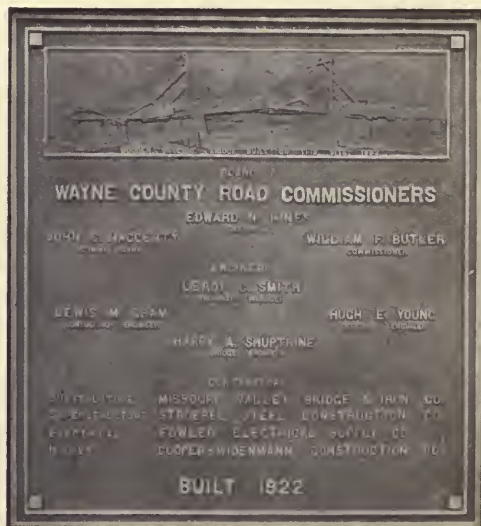
In case the meter is purchased by the allowance of a certain volume of water, it is then only necessary to have an agreement with the consumer that when the volume of water referred to has been taken, the meter then becomes the property of the water department or company, which may or may not agree to maintain the meter at its expense in lieu of having purchased it from the consumer, instead of taking it over without cost to the department or company.

Historic Name-Plates for Bridges

Wayne County Road Commissioners Tell History of Old Bridges Through Attractive Name-Plates

IT is customary for a board of county road commissioners to place a name-plate on a new steel or concrete bridge containing the names of the members of the board, the board's title and the year in which the structure was built. It remained for the Board of County Road Commissioners of Wayne County, Detroit, Mich., to carry this idea to a greater length. On the modern steel bascule bridge completed in 1922 it has installed the usual name-plate with a picture of the old wooden bascule bridge built in 1882 shown at the top of it, as reproduced with this article. This relief was added to the usual name-plate because of the unique construction of the older bridge, which served its purpose for so many years.

During 1922, according to the latest report of the Board of Wayne County Road Commissioners, nine bridges were built, including the bascule bridges over the Rouge River at Jefferson Avenue West and Fort Street West. The bridge program of this Board is one of the greatest problems it has to face, with the ever-increasing motor truck traffic constantly entering and leaving Detroit. According to Edward N. Hines, Chairman of the Board, the policy has been to select bridges of types best suited to the locations and to combine in each bridge all possible elements of economy, usefulness and beauty. With the rapid expansion of subdivisions, industrial and residential districts to the farthest confines of the county, it is necessary to build for a larger future in so



AN INTERESTING HISTORIC NAME-PLATE

far as funds available will permit, and with this in mind the Board has established a minimum clear width of 27 feet between curb lines on bridges. Furthermore, it is now the policy that all bridges in Wayne County shall be provided with sidewalks. The bridges are designed for trucks of a gross weight of 24 tons.

Are We Substituting the Means for the End?

Industrialized communities neglect the very objects for which it is worth while to acquire riches, in their feverish preoccupation with the means by which riches can be acquired.—R. H. Tauney.

Cleveland's Snow-Fighting Organization

By J. W. Morris

Deputy Commissioner, Division of Streets, Cleveland, Ohio

CLEVELAND, like the majority of American cities, had a real problem to solve in the disposal of its very heavy snowfall of the winter of 1922-23. Each snowfall was fought as it fell, instead of waiting until it had ended, as is usually the case. In previous years no definite plan had ever been worked out to fight snowfall, with consequent serious traffic delays and millions of dollars lost to the downtown merchants.

To prevent this great economic loss to Cleveland merchants, and also to save as much money as possible for the taxpayers of the city, was a task that every man in the street department sought to perform. The equipment which the street department had on hand was altogether inadequate to accomplish any worth-while results, so early in September, 1922, an inventory was made of the equipment, with the object of putting into shape the material on hand and of supplementing the equipment so that

the department would be ready to operate at a minute's notice.

Having decided that snow fighting instead of snow removal would be the program, we investigated various kinds of snow-handling equipment, many of which had real merit, but, owing to the possibility of delay in delivery, the department decided to use snow-plows as the most economical and expeditious means for snow fighting. In line with the program, 13 Baker snow-plows were purchased, making a total of 15 owned by the Department. These plows were attached to 15 heavy-duty White trucks, including six flushers and the remainder 3½- and 5-ton dump-trucks. With this equipment every snow-storm was handled last winter.

Procedure

The usual procedure was to follow the Cleveland Railway Company's rotary brooms and after the snow was swept from



WHITE FLUSHER AND DUMP-TRUCK EQUIPPED WITH BAKER SNOW-PLOWS, A PART OF THE EQUIPMENT OF THE DIVISION OF STREETS, CLEVELAND, OHIO, FOR SNOW REMOVAL

the car tracks the plows, working in batteries of two, pushed the snow to the curb. Only in the immediate down-town section was the snow entirely removed from the streets, the rest along the main traffic lanes being left at the curb or on the tree lawn spaces. After the snow was piled at the curbs, the laborers opened a space around each catch-basin to permit the water to flow off after a thaw. Usually the snow which was removed from the thoroughfares was dumped by the trucks and wagons into vacant lots or dumps near the base of operations instead of into main sewers on heavily traveled streets, where a congestion of traffic was liable to result.

After the equipment was installed and ready to operate, we waited for the first heavy snowfall, which occurred on December 14, when $8\frac{1}{2}$ inches fell during 24 hours. Not once during this period was a single traffic delay reported, and holiday trading continued uninterrupted. So unusual was the method employed in fighting the fall of snow in Cleveland that the *Cleveland Plain Dealer* commented upon it very favorably in an editorial entitled "Battling the Beautiful."

All of this service was made possible by the fact that a definite plan had been arranged and was carried out. The down-town district where the most serious results obtain during a snowfall was

divided into six sections, each section in charge of a district foreman with plows, trucks, teams and snow shovelers. Each district foreman was held strictly accountable for his district, and this arrangement made it possible for every part of the down-town section to have attention at the same time. After the down-town district was cleared, the plows proceeded to the other main traffic lanes, diverging from the Square. In practically every instance, the down-town section was cleaned and every main traffic lane opened by six o'clock in the morning.

The personnel and equipment of the department consisted of 300 men, 30 $2\frac{1}{2}$ -ton dump-trucks, 15 heavy-duty trucks with plow attachments, and 50 teams. Approximately 660 miles of streets were cleaned at an expenditure of \$17,148.40. All the men and teams used during each heavy snowfall were employed regularly by the street department in ash and rubbish removal work and were temporarily diverted for snow-removal purposes. Only once during the entire winter was it found necessary to use additional laborers, and that was on the occasion of the first heavy snowfall, on December 14, when 20 additional men were employed. Flushing the streets was resorted to on three or four occasions during the winter when weather conditions made it possible.

Incandescent Lamps for Street Lighting

A Review of the Lamp Report of the National Electric Lighting Association

ABOUT $1\frac{1}{2}$ per cent of the incandescent lamps sold in the United States belong to the street series group. This does not indicate the proportion of lamps used for street lighting, as many lamps of the 115-volt group are used on multiple street-lighting circuits.

The standard series circuit for incandescent lamps is 6.6 amperes, and probably 70 per cent of the lamps in this group are burned on this circuit. This is because the efficiency of 6.6-ampere lamps of the ordinary sizes is greater than those for other currents. These 6.6-ampere lamps constitute 60 of the 70 per cent. The high-candle-power sizes, which constitute over 10 per cent of the group, are more efficient if made for 20 amperes, so these lamps are

usually operated on compensators to permit their use on 6.6-ampere circuits.

The other series lamps are 4 amperes covering 9 per cent, 5.5 amperes covering less than 8 per cent, and 7.5 amperes covering 12 per cent of the demand in the street series group. It should be noted that the so-called 4-, 5.5- and 6.6-ampere luminous or magnetite arc rectifier circuits supply a current with a mean effective heating value which is different from the figures given. For this reason, special lamps are made for use on these circuits, being labeled the nominal amperes of the circuit, but actually made for the heating value of the current. For example, the 4-ampere lamp for General Electric rectifier circuits is actually made for 4.25 amperes, though labeled "4

amp. G. E. rect." The 4-ampere lamp for use on Westinghouse rectifier circuits is actually made for 4.1 amperes, though labeled "4 amp. West. rect." In addition, these series lamps for use on rectifier circuits are designed to operate at a poorer efficiency than regular series lamps operated on constant-current transformers, in order to compensate for the great surges in current which occur on rectifier circuits. For this reason the vacuum tungsten filament lamp is recommended unless a surge arrester is used, as the filament in the gas-filled lamp operates closer to its melting temperature than the filament in a vacuum lamp.

There has been a considerable increase in the size of the average street series lamp used during the past 16 years. Within a short time, about two years after the tungsten filament series lamp appeared in 1907, the carbon and Gem series lamps previously used were withdrawn from the market. In 1907, the average candle-

power was 32, which, converted to the present lumen rating, becomes practically 320 lumens. This gradually increased to 600 lumens in 1913, when the gas-filled tungsten series lamps appeared. This made it possible to make such an efficient high-candle-power incandescent street-lighting lamp that they soon replaced the carbon arc lamps previously used. This demand greatly increased the average size of the lamps sold, the average lumens rising to over 1,600 in 1917. In 1922 it was over 1,700.

The smallest street series lamp regularly listed is 600 lumens, the lamps being made in 8 sizes, up to and including 25,000 lumens. There still is a demand, aggregating about 12½ per cent of the series group, for lamps of less than 600 lumens. The lamp report again refers to the undesirability of using such small sizes, as lamps producing less than 600 lumens are inadequate and uneconomical under ordinary street lighting conditions.

Data on Water Furnished to Schools

THE following table, recently published in *Kansas Municipalities*, gives some interesting information on how various cities handle the matter of furnishing water to schools, as outlined in the following questions:

1. Is water furnished free to schools?
2. If not, do they pay less than other consumers?
3. If they pay less, what is the rate?
4. Is there any difference in rates charged for water furnished board of education offices and for that furnished to the school building?

City	Replies to Questions			
	1	2	3	4
Arkansas City	No	No	...	No
Atchison	No	No	...	No
Chanute	No	No	...	No
Coffeyville	No	No	...	No
El Dorado	No	No	...	No
Emporia	No	No	...	No
Hutchinson	No	No	...	No
Iola	No	No	...	No
Independence	No	No	...	No
Junction City	No	No	...	No
Kansas City, Kans.	No	No	...	No
Lawrence	No	Yes	10c	*
Manhattan	Yes	...	...	...
Newton	No	No	...	No
Ottawa	No	No	...	No
Parsons	No	No	...	No
Pittsburgh	No	Yes	†	No
Pratt	No	No	...	No
Topeka	No	No	...	...
Wellington	No	No	...	...
Winfield	No	No	...	No

* Water used by Board of Education has been paid by owner of building in which offices were located.

† 15 cents. They have a special rate of \$25 per year for swimming pool purposes.

In Fort Scott, each school building has a meter, but the readings are all added and the sliding scale applied to the total consumption.

PLEASE SAVE WATER

The unusually low rainfall during the past nine months, which has been 33% below normal, has resulted in water shortages throughout the Eastern States.

Even our reserve supply in storage has been reduced to a minimum beyond which it is not safe to go.

We are, therefore, compelled to notify our consumers that it will be necessary for them to exercise the utmost economy in the use of water in order to avert the serious consequences of a water famine.

Unless consumers commence at once to co-operate with the Company in conserving the supply it will be necessary within a few days to discontinue service for a portion of each day.

Construction work in progress last winter, which it was impossible on account of the early drought to complete in time to store the ordinary Spring rains, is now complete and will be available for storage purposes during the ensuing year, thus protecting the supply against future shortage.

Please, therefore, save water in every possible way until abundant rain falls, and ask your neighbors to do the same. We explain the situation thus frankly to all, knowing that you will appreciate it and loyally help in this community problem.

Hackensack Water Company

During the Acute Water Shortage of September and October, 1923, This Advertisement Appeared in Newspapers Throughout New Jersey and in Several New York City Papers. It Shows the Use of General Publicity in Combating a Very Serious Situation.

The Maintenance of Asphalt Streets in Philadelphia

Outline of Operation of Municipal Asphalt Plant with Costs for Street Repairs

ACCORDING to Fred C. Dunlap, Chief, Bureau of Highways, Philadelphia, Pa., in his annual report for the year ending December 31, 1922, the municipal asphalt plant, which began operations in March, 1921, had its first full year of operation in 1922, during which it produced 63,599 tons of paving mixture, as against 42,510 tons in 1921 for the period from March 21 to the end of the year. With various minor defects corrected and improvements made, the average daily output of the plant was increased from 215 tons in 1921 to 253 tons in 1922:

MONTHLY PRODUCTION OF PAVING MIXTURES JANUARY 1-DECEMBER 31, 1922

	Tons
January	1,133
February	991
March	4,002
April	5,962
May	7,350
June	7,263
July	8,106
August	7,060
September	7,246
October	6,073
November	6,314
December	2,098
	<u>63,598</u>

Increased efficiency in production, lower unskilled labor rates, and advantageous material contracts permitted a reduction in cost per ton at the plant from \$5.016 in 1921 to \$4.114 in 1922:

AVERAGE COST PER TON—ASPHALT PAVING MIXTURES—MUNICIPAL ASPHALT PLANT January 1-December 31, 1922

	Quantity	Cost
Labor		\$45,052.07
Sand	30,600 cu. yds.	24,580.84
Crushed pebbles, slag and stone	20,833 tons	38,135.40
Filler (limestone dust) ..	3,476 tons	18,527.52
Asphalt cement	5,349 tons	73,479.83
Fuel oil	452,632 gallons	22,185.12
Repairs, depreciation and miscellaneous		<u>39,689.97</u>
Total cost		\$261,650.75
Total number of tons produced.....		63,598
Cost per ton at the plant.....		<u>\$4.114</u>

In order to supply the needs of West Philadelphia, contracts were also made under which 31,759 tons of surface mixture and binder, costing \$128,356, or an average price of \$4.04 per ton, were purchased and laid by city forces.

The following table summarizes the cost

of asphalt repair work by city forces:

City plant:	Number of Tons	Cost
Wearing surface and bituminous concrete	63,599	\$261,650.75
Contractors' plants:		
Binder and wearing surface.....	31,759	128,356.41
	<u>95,358</u>	<u>\$390,007.16</u>

In the street work the organization was similar to that employed the previous year. In the early portion of the year the small "jitney" gangs which were used in 1921 were employed to make rapid emergency repairs to remove dangerous conditions. When weather conditions permitted the resumption of work on a larger scale, these small gangs were combined.

CHARACTER AND AMOUNT OF ASPHALT REPAIRS

Character of Works	Square Yards	Paving Mixtures, Pounds per Sq. Yd.
Resurfacing (surface heaters).....	489,629	220
Cutting out method	310,141	240
Emergency or "jitney" gangs....	39,539	209
	<u>839,309</u>	<u>227</u>

In general, six large cut-out gangs were operating, and four surface heater gangs, using from four to six heaters. The work performed by the asphalt repair forces consisted in placing 95,358 tons of paving mixture in 349,680 square yards of repairs by the cutting-out method and 489,629 square yards by the surface heater method, a total of 839,309 square yards of work, as compared with 699,211 square yards in the previous year. The average unit cost in 1922 was \$1.04 per square yard, compared with \$1.09 in 1921. The comparison fails, however, to show the true relation between the two years' work, as a greater quantity of material was used in each square yard in 1922 in the effort to produce more substantial and lasting repairs.

AVERAGE COST PER SQUARE YARD OF ASPHALT REPAIRS

Paving mixtures	\$390,007.16
Hauling	103,109.42
Laying	342,123.87
Fuel oil	10,063.92
Royalties, maintenance of equipment and miscellaneous	<u>31,322.04</u>
	<u>\$876,626.41</u>
Average cost per square yard.....	<u>1.044</u>

The Cost of Modern Roads

By J. T. Madison

Office Engineer, Department of State Roads, Frankfort, Ky.

NO one has yet predicted clearly the increase in number of motor vehicles, or weight per motor vehicle loaded for any appreciable period of years. It is known, however, that increasingly heavy loads are being sent out over this country's roads and that even greater ones may be imposed upon the state and national highways if the experience of England and some other countries is indicative of the trend. With this unknown quantity confronting it, the engineering profession has attempted to design and construct roads that meet present necessities and seem reasonably to anticipate future requirements. The cost of doing this work has exceeded by thousands of dollars that amount ordinarily estimated by the mildly interested onlooker, whose precedents are the cost of building narrow water-bound macadam roads in years past.

From the year 1912, when the present road department of Kentucky was organized, up to 1918, the biennial reports indicate that a large proportion of roads constructed or reconstructed ranged in price from \$2,000 to \$10,000 per mile. There were numerous instances where these figures were exceeded, but on the whole they are representative.

Much of the work done was no more than maintenance and could not be dignified by the term "construction."

Since the present Kentucky road law went into effect in 1920, the cost of building roads has increased to from \$10,000 to \$40,000 per mile, depending on whether the road was graded only, or graded and surfaced. Some contracts have cost as

high as \$60,000 per mile, but these are the exception and are found where extraordinary conditions existed, such as heavy grading and wider paving.

Cost Analyses

The following figures are general and serve chiefly to convey an idea of the relative costs of different kinds of surfacing; the costs of maintaining each; and ultimately the average cost per vehicle-mile

per year through a cycle of fifteen years. It is assumed that high-type surfaces, with proper maintenance, will withstand present-day traffic for fifteen years, so that the original cost per mile, meaning by that, construction cost, plus the total cost of maintenance throughout the fifteen years, or the assumed life of the paving before major repairs must be made, constitute the cost of a cycle. For

The Need for Modern Roads

Roads of past years carrying from 25 to 75 steel-tired vehicles per day that constantly rolled down and compacted the old macadam highways, cost very little when compared with what is termed "modern highways," or those capable of withstanding the traffic of from 200 to 2,000 motor vehicles per day with rubber tires that do not compact macadam, but rather pick up the loose particles by suction and, aided by the wind, throw them into adjoining fields. The result has been a satisfactory surface for about two years, then an increasingly bad one for many years, until the county officials have to make some sort of repair or leave the country. This, in short, is the explanation of the necessity for modern roads.

the different types of surfacing, a vehicle-carrying capacity has also been assumed, and the ultimate cost per vehicle-mile per year calculated. The last is most important to this discussion of modern roads, because it is an interpretation of the economic value of a hard surface when compared to a lower type of surface, or merely an earth road.

The term hard surface, as used here, includes concrete, rock asphalt, and bituminous concrete, at an average cost of \$36,000 per mile. The next in decreasing order of hardness is penetration macadam at about \$30,000 per mile, then surface-treated macadam at about \$23,000, gravel at about \$19,000, and grade and drain only at from \$10,000 to \$15,000 per mile. These figures

are not strictly averages, but represent quite closely the values of the respective types, taken from experience in the state of Kentucky.

The cost of maintaining and repairing a mile of each of these types per year is approximately as follows: hard surfaces, \$360; penetration macadam, \$250; surface-treated macadam, \$500; gravel, \$390; grade and drain, \$420. For a period of fifteen years, using these closely correct figures derived from the Maintenance Division's records for 1922, it is found that the ultimate cost per mile for each type, including construction cost and maintenance throughout the cycle of fifteen years, is as follows: hard surface, \$41,000; penetration macadam, \$34,000; surface-treated macadam, \$30,000; gravel, \$25,000; and grade and drain, \$20,000. These totals interpreted in terms of capacity to withstand

traffic, expressed as cost per vehicle-mile per year, are as follows: hard surface, \$20; penetration macadam, \$28; surface-treated macadam, \$37; gravel, \$50; and grade and drain, \$100. In this deduction it has been assumed that for an 18-foot pavement a certain number of vehicles per day are capable of being handled throughout the year with no excessive or undue wear; that is, that the road could be reasonably well maintained the year round with a certain volume of traffic passing over it daily. This assumption was that the following number of motor vehicles daily could be successfully handled by the different kinds of paving in Kentucky: hard surface, 2,000; penetration macadam, 1,200; surface-treated macadam, 800; gravel, 500; and grade and drain, 200.

ACKNOWLEDGMENT.—From a paper read before the Kentucky Highway Engineers' Association.

Marooned in Mud

Opponents of Surfaced Roads Unable to Meet for Protest

CONSIDERABLE amusement has been enjoyed among the hard-surfaced-road advocates of Iowa, as a result of the demoralization which struck their opponents at a meeting scheduled to have been held at Marshalltown recently. Marshall County voted an \$800,000 bond issue for paving roads. The proposal was victorious by a close margin in the county at large, the rural precinct having piled up a majority against it, but insufficient to overcome the lead given the project in the city of Marshalltown. The mud-roads advo-

cates instituted court action to throw out the election, and to promote their movement called a mass meeting to be held at Marshalltown.

Then it rained. The speakers were unable to get to town on account of the mud. The farmers who opposed paving and wanted to hear it denounced had to stay at home. Their homes might as well have been a thousand miles from town. A few of the anti's in town hung around the meeting place a few minutes waiting for speakers who did not come, and the meeting was off.—*The Constructor*.

Epidemics of Water-borne Diseases

IN past ages when a city was smitten with an epidemic, the people sought to placate some offended deity. Nowadays they pour oil on the mosquito ponds or look for pollution in the water or milk supplies. This is not to imply that the older method did not produce the desired result; rather it is a heeding of the admonition that "The Lord helps him who helps himself."

During the last twelve months there have been several mysterious typhoid fever outbreaks in cities with supposedly well-guarded water-supplies. In one of these it was found that the pure water in the city mains was contaminated through a leaky valve on a special fire service connection. It was never intended that contaminated water from the special fire-main should get into the city mains; but it did, as was amply proved when a careful check-up of the epidemic had indicated where it was most prevalent.

The amount of contaminated water which leaked into the treated supply in the mains could not have been great, but the damage it did illustrates startlingly the extent to which we have made sewers of streams that were once

pure. The Indian was rather free and easy with his tomahawk and scalping knife, but at least he didn't poison the streams with filth, and it would take a good many tomahawks and iron-muscled braves to slay as many people as the untreated water from almost any stream in the settled parts of the country would if its waters were drunk without filtering and treating.

Recently a group of people in a western city "lawed" the municipality out of \$32,821 because they got typhoid fever from drinking the supposedly safe city water. It was brought out in court that on account of lack of sufficient chlorine, untreated river water was pumped into the mains for just one day. One hundred fifty cases of typhoid fever resulted. The victims pooled their interests, sued the city and recovered damages to the extent of \$32,821.

Not the whim of deity, but man's own laziness or uncleanness, is responsible for most epidemics, and it is quite likely that the wholesome lesson given by the western typhoid victims who collected damages from the city for its servants' negligence is quite as salutary as anything could be.—*The American Bulletin*.

Old Automobile Tires Make Noiseless Grade Crossings

The Development of Rubber Block Paving in the United States and Great Britain

THE accompanying illustration shows the first section of rubber crossing laid for the Chicago, Milwaukee & St. Paul Railroad at its Main Street crossing in Racine, Wis. This crossing is laid in sections 4 feet wide by 5 feet long, and the rubber blocks made by the Wright Rubber Products Company, Racine, Wis., are secured by both cement and wood screws by means of a patented lug to a foundation of 4-by 6-inch hardwood timbers. These are securely bolted together with several $\frac{1}{2}$ -inch bolts. The guard-rail is bolted on each side of the section, the rubber blocks coming up even with the top of the guard-rail. Each section is lag-screwed to the ties so that in case of a split rail or a broken tie, it is only necessary to remove six lag screws with the socket wrench, and the section of the crossing can be pushed to one side and repairs made.

This crossing of rubber blocks has been installed where the traffic is extremely heavy. Thousands of automobiles and trucks as well as teams cross it each day. The wooden crossing shown in the illustration was laid less than 60 days before the picture was taken and is shown completely loosened from the foundation. It is interesting to note the surprise of observers over the fact that the sharp calks of horses have no effect on the new rubber pavement. It is also interesting to note the noiselessness of a heavy truck when it hits the rubber paving.

These rubber bricks are made under hydraulic pressure of several thousand pounds to the square inch and are molded separately. The main ingredient is ground-up old automobile tires to which have been



GRADE CROSSING IN RACINE, WIS., SHOWING SECTION PAVED WITH RUBBER BLOCKS

added other wear-resisting compounds upon which age has little or no effect. With the patented lugs it is possible to lay this pavement on top of a concrete base without fastening, inasmuch as the whole pavement is tied together by the interlocking lugs. On street paving the curb lines would furnish the proper protection on the sides, and an iron beam could be put across sunk in the concrete at reasonable distances to take care of the danger of movement lengthwise of the street.

Old and New Rubber Road Experiments Abroad

According to *Roads and Road Construction*, London, England, Evan J. Edwards, in speaking on the subject of rubber roadways at a meeting of the Engineers' Club of London, referred to the potentialities of rubber paving. The first rubber road ever constructed was invented by Morland M. Dessau. That was in 1913, when a portion of the road at the junction of the New and Old Kent Roads, Southwark, was laid with rubber. In this case the method was to mount wood blocks with half an inch of pure plantation rubber. The war hin-

dered experiments, but during the last two years much attention has been given to the question.

In addition to Mr. Dessau's method, several others have been adopted. Much interest has been shown in the rubber blocks laid around the Cenotaph in Whitehall, London. In this case a smooth concrete surface was prepared, and hot pitch was sprayed on it just prior to the laying of the rubber. The rubber blocks were constructed with a groove on one side and a corresponding projection on the other, so that when laid the blocks were locked in position.

Rubber roads constructed by a different method have been laid in Glasgow and Edinburgh during the present year. In these cases a rubber block measuring 9 by $4\frac{1}{2}$ by 2 inches was fixed by means of imbedded steel spikes into a concrete base block of slightly smaller dimensions. These blocks were laid on a prepared concrete foundation and were grouted in with cement or pitch. It was recommended by the makers that these particular blocks should be laid when the concrete foundation of the road was set, but still in a green condition, the surface of the concrete being smeared with a mixture of one part cement and three parts sand. While this was just

damp, the rubber block with the under concrete base molded into it was set in position and then grouted in with cement. The whole was then allowed to set before traffic was permitted to pass over it, but if that delay were not possible, the rubber blocks could be grouted into position with pitch or bitumen. The top surface of the blocks laid in Edinburgh and Glasgow contained 30 per cent of plantation rubber and no reclaimed material.

Mr. Edwards' personal opinion was that the greatest point in rubber roadways will be proved to be ultimate economy, as it is the only road material which will absorb and distribute the weight of the traffic carried. Other materials by their relative non-resilience immediately transmit the load to the foundation of the road. Large slabs of rubber were laid a good many years ago at the entrance to St. Pancras and Euston railway stations, London, though as these were under cover the results obtained are not of very great use when considering ordinary roadways. Over 20 years ago a rubber road was laid in Princes Street, Edinburgh, and although it has been walked upon by many millions of people, it has been found to have lost only a fraction of an inch in thickness during that period of intensive service.

Railroads Help in Pollution Emergency

New York Central and Pennsylvania Railroads Cut Red Tape and Help Village of Cuba, N. Y.

THE interest of railroad officials in the health of the people of cities and towns in the United States is instanced in the recent action of J. C. McNamara, Assistant General Baggage Agent of the New York Central Railroad at Albany, N. Y.

The village of Cuba, a small community in the southwestern part of New York State, was suffering from a scarcity of water, which is taken from wells, and it became necessary to pump water from a creek. This creek, running through farm land, received the surface drainage and heavy pollution. C. A. Holmquist, Director of the Division of Sanitation of the State Health Department, was consulted, and informed the officials that if the creek water were properly chlorinated it would not be dangerous for drinking purposes. The State Health Department has a chlorination apparatus which it lends to communities in emergencies. Under ordinary circumstances, railroads do not permit this apparatus to be carried as personal baggage. On this occasion, however, Dr. Mat-

thias Nicoll, Jr., State Health Commissioner, telephoned to Mr. McNamara, who arranged for the apparatus to be put upon the Empire State Express leaving Albany at 11:35 in the morning. This train had no baggage car. Mr. McNamara, however, knowing that it was necessary to make close connection with the Pennsylvania Railroad at Rochester, on his own initiative then communicated with the baggage departments of both railroads in that city, requesting them to facilitate matters in Rochester. When the Health Department engineer arrived he found that arrangements had been made for the transportation of himself and the apparatus across the city. A taxi was waiting to make the transfer to the Pennsylvania Station, where transportation was materially expedited.

As a result of this cooperation of the railroad official with the State Health Department, the chlorination apparatus was set up and in operation on the evening of the same day, and the residents of Cuba were saved from the very possible ravages of epidemic disease.

School-Building Programs

Their Scientific Development as Exemplified in Solvay, N. Y.

By N. L. Engelhardt

Professor of Education, Teachers College, Columbia University

THE school-building needs of the United States have been growing to vast proportions. Two of the most important factors contributing to this growth are the increases made in educational enrollments due to the stimulus of the war, and the very rapid increase in our urban population at the expense of the rural sections of the country.

With school enrollments increasing from 15 per cent to 20 per cent and over of the total population of communities, and with the total population mounting rapidly, school-building needs have been increased in proportion. The Great War has also resulted in very significant increases in enrollments in junior and senior high schools.

Without these additions to school enrollment, the cost of education would naturally have increased in proportion with the increases which have occurred in all other fields. The increases in enrollments have necessitated the payment of additional salaries, the provision of more classrooms, and the extension of the curricula, and added to the cost of maintenance and operation to a degree which had not been anticipated. These additional educational costs, as well as the natural increases due to the war, have raised questions of economy and scientific planning which were not necessarily matters of great concern when educational costs were low.

To devote the largest possible proportion of the educational budget to the productive phase of education, namely, the cost of instruction, expenses of maintenance and

operation and of general overhead must be proportionately reduced. To secure such reductions, school buildings must be more carefully planned, the number of school buildings must be reduced, and the scientific elements of physical plant development must be given full consideration.

During the year 1921, \$240,000,000 worth of school bonds were issued in the United States. The issuance of bonds is the usual method of raising funds for additions to the school plant. In a number of cases,

however, communities have paid out of current funds for the costs of additions to the school plant. Thus, a total of about \$300,000,000 was invested in school buildings during the year 1921. The returns for the year 1922 indicate that this amount was exceeded during that period. The importance, therefore, of proper building planning cannot be

Planning Before Spending

Far-sighted boards of education, anxious to reduce present and future costs, have in recent years resorted to the scientific planning of school-building programs. These boards have realized that the erection of buildings, without the acceptance and use of definite planning standards, will keep future maintenance and operation costs at an unreasonably high level. Therefore, before spending money for new buildings, these boards have endeavored to develop a comprehensive building program which would give full consideration to future needs and trends and permit of additions at the lowest possible cost.

stressed too greatly.

Standards for Consideration

Some of the important standards which the writer has set for consideration in the planning of school-building programs* are as follows:

1. Large school buildings housing a minimum of 1,000 to 1,200 pupils should be considered as the desirable parts of a future school plant.

* Baltimore School Building Survey, Vol. 1.—By G. D. Strayer and N. L. Engelhardt. Albrecht Company, 211 South Sharp Street, Baltimore, Md.

Atlanta School Building Survey, Vol. I.—By G. D. Strayer and N. L. Engelhardt. Foote & Davies Company, Atlanta, Ga.

White Plains School Building Survey.—By G. D. Strayer, N. L. Engelhardt and P. C. Packer. Board of Education, White Plains, N. Y.

2. All school buildings should be planned in terms of units which permit of sufficient construction to meet immediate needs and supplementary construction as needs require.

3. School buildings should be so located that there will be no overlapping among the districts served. This requires the acceptance of definite travel distances for children of the various school periods: one-half mile for the elementary school; one mile for the junior high schools; and one and a half or more for the senior high schools.

4. A large school building with a large enrollment requires a large site. Elementary schools should have sites of 4 to 5 acres, junior high schools sites of 6 to 10 acres, and senior high schools sites of 10 acres and above.

5. School-building planning must anticipate population needs and should consider every element of adult and child population growth.

6. All school-building development should be in terms of a zoning plan for the city which takes into consideration the residential areas, park development, street development and industrial development.

Analyzing a Local Problem

The village of Solvay, N. Y., is one of the many communities which, in the spring of 1923, found themselves confronted with school-building programs as a result of the conditions above named. The old high school building had been overcrowded to the point where to-day it can only house the children of the junior high school enrollment. It had been found necessary to provide temporary quarters for the senior

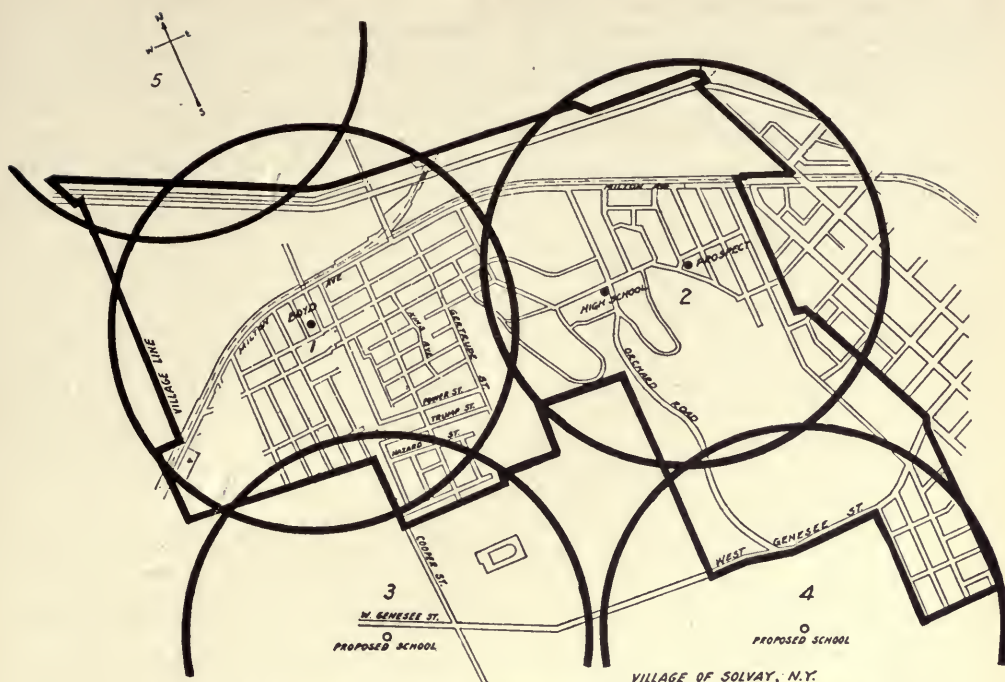
high school above one of the village banks. The village is growing consistently because of its fortunate proximity to the city of Syracuse and the additions which are being made to its industries. Its elementary schools were also greatly overcrowded and thus added to the difficulty of the building problem which the Board of Education found it necessary to solve.

Without due reference to the standards for future school planning enumerated above, a site had been selected and a high school building was being planned as a partial solution of the problem, when much dissatisfaction arose among the school patrons, and the writer was called in as an educational adviser on the future development of the system.

As part of the technique used in analyzing the problem, maps were made showing the distribution of elementary school population and their relationship to the existing elementary schools and the existing high school. The circles of Map No. 1 show the residential areas of the existing elementary schools. The elementary schools are the center of these circles and are marked "Boyd" and "Prospect." The elementary school population is apparently divided into two distinct parts. The heavy irregular lines of Map No. 1 are the lines of the present village of Solvay and are



MAP NO. 1, SHOWING DISTRIBUTION OF PRESENT ELEMENTARY SCHOOL SYSTEM



MAP NO. 2, SHOWING FUTURE ELEMENTARY SCHOOL DEVELOPMENT

the lines which approximate the present school district of Solvay.

The existing high school building and its site were carefully studied. The outstanding faults of the existing Solvay high school building are the lack of planning for expansibility and elasticity. Changes can be made within the structure itself and additions constructed only at excessive costs. The site is not large enough for the future high school building of Solvay. The location is not central enough with respect to present or future high school population. The building is non-fire-proof in nature and has a very inadequate exit arrangement. All three interior stairways force the congregation of classes moving from the second floor to a point on the first floor which is about the central point in the building. This is a very unfortunate means of exit. The third floor is inadequately lighted, insufficiently heated and poorly ventilated, and does not afford adequate protection against fire danger. A community like Solvay ought never to be content to house its children under the conditions prevailing on this third floor of the high school.

The shops of this building are make-

shifts which have served their time. The interests of future high school children require that the shops be taken out of the basement and put in light, dry, well-ventilated quarters. The other special room facilities that are necessary in a high school building, such as auditorium, gymnasium, lunchroom, library and the like, are either totally lacking or so very meager as to make it necessary to provide for complete replacements.

The building is located in a very attractive setting. This has tended to give a better impression of what this building provides than the interior actually presents. The building probably can be used for school purposes over a continued period of time. It should not be used for junior or senior high school purposes, however, but may perhaps satisfy the continuation school needs of the community.

The Planning of the Future Elementary School Plant

In order to make recommendations for the future school plant, the writer studied very carefully the entire village and proposed that extensions be made to the sites of both existing elementary schools and that

the buildings be added to as future needs required in those particular sections. It was also proposed that schools be planned to the south of the existing schools, as shown on Map No. 2, with a minimum of overlapping among the circles as indicated on this map. The village of Solvay will, in a short time, extend its boundaries to the south, there being physical limitations which make it impossible for any extensions to the east and north, while the residential trends are all in favor of the southern development.

With Map No. 2 before it, the Board of Education will have little difficulty in locating its future elementary schools, as adequate sites are available at the points indicated. With this map before it, the Board will also keep down to a minimum the number of schools and will build schools in which the cost of administration, maintenance and operation can be kept as low as can reasonably be expected.

The Future High School Program

Solvay has for a long time accepted the junior-senior high school as a part of its educational program and has established a national reputation among educators for

the splendid work it has done in this particular field. The enrollment in the junior-senior high school has grown rapidly and will soon reach 750 children out of an estimated total school enrollment of 2,200 children. The distribution of the present high school enrollment is indicated in Map No. 3, each dot on this map representing one child who is now attending the junior-senior high school. The future high school enrollment promises to be distributed rather evenly throughout the area indicated by the largest circle on Map No. 3. In other words, with the extensions of the village to the south and west and along the West Genesee highway, which is a continuation of one of the principal streets of Syracuse, a shift in the location of the high school will be necessitated if it is to be centralized with respect to future population needs. A central location for a high school cannot always be secured. There is, however, an open park and adequate territory situated in the very center of what promises to be the future village of Solvay. An area of approximately 20 acres is indicated by the smaller circle of Map No. 3. Here is open land sufficiently large to meet the high school needs of Solvay probably for



MAP NO. 3, SHOWING CORRECT LOCATION AND PRESENT DISTRIBUTION OF STUDENTS FOR JUNIOR-SENIOR HIGH SCHOOL

a period of 50 years, and upon the recommendation of the writer, the Solvay Board of Education selected this as a site for its new high school.

It was necessary for the citizens of Solvay to pass their judgment upon this site as a desirable one for future school expansion. The matter was placed before the citizens in a referendum vote on August 22. The site met with the approval of a very large majority of the citizens of the village, as 501 voted for it and 126 voted in opposition. It was also voted at this time to set aside a sum of approximately \$480,000 for the erection of a school building which would satisfy the junior and senior high school needs.

The factors which, to the greatest degree, influenced the Board of Education and the citizens of Solvay in the selection of this site and in the investment of such

a large sum of the taxpayers' money for the addition to the school plant were the elements of scientific program planning enumerated above. The citizens felt assured that they were planning for a very extended period of time. They felt assured that the elements of elasticity and expansibility at the lowest possible cost had been given full consideration. They recognized that the building, when erected, would become a great community asset. They realized that the plan gave equal consideration to the needs of all children.

The citizens of Solvay have accepted this plan for the future development of the school plant because the conclusions presented to them were made on the basis of carefully collected data and widely accepted standards and not on the basis of personal or political judgments or in the interests of private or group gain.

Incidents in a Placid Day of a Modern Mayor

From the *Jamestown Evening Journal's* Column of "Sidelights and Soliloquies"

Place.—Mayor's office, City Hall.

Time.—11 o'clock.

Scene.—Mayor Samuel A. Carlson is dictating to a pretty stenographer. On his desk are numerous newspaper clippings, copies of *The Modern City*, and other miscellaneous articles.

Mayor (dictating reply to Attorney Benjamin S. Dean on the home rule amendment).—"This proposed measure gives to Jamestown the right to revise her charter and—no, cross that out! This measure gives Jamestown the right to govern itself without——"

(Telephone rings.)

Mayor (picking up instrument).—"Hello! Yes, this is the mayor. Yes—I see—of course—certainly—I'll have it attended to—. Yes, I'll see to it right away. You're welcome." (Hangs up phone with a sigh and turns to stenographer.) "Please make a note to inform the police that two boys, playing football in Falconer Street, near Lake View Avenue, are annoying the neighbors when they shout their football signals. Some woman just complained about it."

(Resuming dictation.) "This measure also—"

(Telephone rings again.)

Mayor.—"Hello. Yes, this is the mayor. Just a moment, please." (Consults notebook.) "Yes, I can speak at the West Side Mothers' Club Friday afternoon at 3 o'clock. All right. I'll be there, madam." (Mayor hangs up and phone rings again insistently.)

Mayor.—"Hello. Yes, this is the mayor." (Listens patiently for five minutes.) "No, madam, I can't stop the postman from crossing your lawn every day, even though you've asked him not to. I suggest that you call up the postmaster. You're welcome. Goodbye."

Four hours later.

(Mayor is signing official documents and looks up at the entry of an elderly woman. Woman seats herself and addresses the mayor. Mayor settles back resignedly to listen for half an hour to advice on how to run the city. Woman finally leaves and a man enters the room, selling tickets to the annual ball of the Blah Blah Society. Mayor buys ticket and man leaves room. Telephone rings.)

Mayor.—"Hello! Yes, this is Mayor Carlson.—Have you? Well, that is very kind of you indeed, and I feel highly honored, sir.—No, I don't have many babies named after me.—You say his name is Carlson, too? What a strange coincidence! Thank you very much. Goodbye."

(Door opens and cross-country hiker, placarded, "From N. Y. to Los Angeles or Bust," enters the room. Hands Mayor a letter signifying that he is a bona-fide resident of Harlem, in good standing in the Elks. Offers to sell the Mayor his photograph on a post-card for the small sum of 10 cents. The chief executive makes the purchase. The hiker also asks for the Mayor's autograph and departs 10 cents and one autograph richer.)

(Mayor resumes work, and a minute goes by. Stenographer opens door and inquires whether or not the Mayor wants to marry a couple who are looking for a parson. The Mayor obligingly does the honors and finally resumes his work. Telephone rings.)

Mayor.—"Hello!—Yes, Mayor Carlson talking.—Why, yes, I shall be very glad to talk before your luncheon club on civil service reform. At noon Saturday, you say?—Yes, I'll be there." (Hangs up.) Curtain.

Greater Public Control Over Private Building Construction

Suburbs of Chicago Adopt Novel Regulations Controlling Subdivisions and Buildings

By Jacob L. Crane, Jr.

Municipal Development Engineer, Chicago

CITY plans, if carefully drawn and enforced, may be entirely successful in directing the growth of the main public features in a city, but city plans have little or no control over the subdivision of ground lying between main streets, nor over the development of the individual private property. And, after all, it is the character of the smaller subdivision and of the buildings erected for private use that determines whether a town may really be called conveniently arranged and beautiful.

Zoning is effective in securing open space and in controlling the density of population, but it cannot attempt to control the appearance of private buildings nor the details of land subdivision. Hence, as supplementary to their city planning and zoning projects, many towns in the Middle West are making a valiant effort to exert a reasonable control over the finer points of subdivisions and over the appearance and arrangement of buildings. This is being accomplished through the adoption of novel subdivision ordinances and building codes.

In the beautiful village of Lake Bluff on the North Shore above Chicago, the writer, in connection with the preparation of a comprehensive town plan, has prepared a Building Ordinance and Subdivision Ordinance incorporating some of the features necessary to produce adequate control over the use of private property. Similar ordinances have been prepared for the suburban city of Wheaton in connection with the writer's town planning work there.

Features of Building Ordinance

In these suburban towns it was decided in the first place to control a number of undesirable practises in dwelling construc-

tion, such as the use of garages or temporary shacks for residence purposes, the construction of houses without foundations other than wooden posts, and the use of needlessly ugly designs and exterior treatment for house construction. Accordingly, clauses have been inserted to control these features. Buildings used for residence purposes are required to be built on masonry foundations extending below frost line; they must have a number of rooms at least equaling the number of occupants, and the minimum size of living-room and bedrooms is established. And, finally, the plans for each building must be submitted to the Town Planning Commission for the examination of the architectural features. The only restriction as to architectural standards is that "every building shall be so designed and constructed as to be suitable from the architectural standpoint in its environment." In effect, this type of control has been in use for some time in at least two Chicago suburbs, but this is the first building ordinance in which the architectural requirement is mentioned.

A further provision is made to the effect

The Architectural Design

Of This Building

Has Been Approved

by the

Lake Bluff Plan Commission

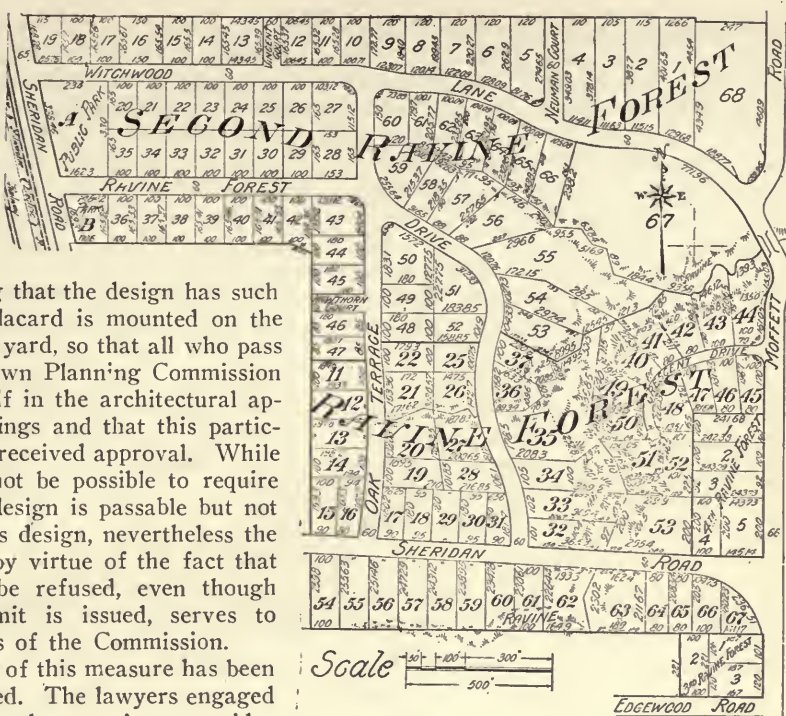
Dated _____ Chairman _____ Secretary _____

PLACARD ISSUED WITH BUILDING PERMIT,
LAKE BLUFF, ILL.

that when the Town Planning Commission approves the design of a building from the architectural standpoint, a placard is issued with the building permit, stating that the design has such approval. The placard is mounted on the building or in the yard, so that all who pass know that the Town Planning Commission is interesting itself in the architectural appearance of buildings and that this particular building has received approval. While it will probably not be possible to require an owner whose design is passable but not good to change his design, nevertheless the pressure exerted by virtue of the fact that the placard can be refused, even though the building permit is issued, serves to enforce the wishes of the Commission.

The legal aspect of this measure has been carefully considered. The lawyers engaged in connection with these projects consider that such regulations are reasonable and that, in view of the tendency of the courts, as indicated by recent decisions, to give greater importance to architectural standards, the legality of these clauses is fairly well assured so long as they are preserved in their present moderate form. This type of control does not, of course, assure beautiful buildings in all cases, but it does serve effectively to accomplish two extremely important objects: first, it stimulates interest in architectural standards in building, and that in itself is half the battle; and second, it will in most cases prevent the construction of the occasional monstrosity. Throughout the administration of this ordinance the greatest care is taken to see that the ideas of individuals are not imposed unfairly upon the man who has originality in the plans for his building. Opinions differ violently in the matter of what is good architecture and what is not, so that only most general and moderate control can be attempted. In any case, such regulations seem to be justified for general application only in the highest type of suburb, and in the occasional highly developed small or middle-sized town.

Partly to compensate for the additional restrictions outlined above and also to per-



SUBDIVISION APPROVED BY LAKE BLUFF COMMISSION

The topography is followed and the streets are arranged to connect to the existing street system. The lots are large and a park is provided. The plat does not show required easements along rear lot lines, nor along Sheridan Road, taken to make possible the future widening by 15 feet on each side.

mit all possible saving in building costs, the structural requirements are made as moderate as is compatible with safety. For example, the writer recommended the standards for small house construction outlined by the Building Committee of the United States Department of Commerce.

Subdivision Ordinance

In these smaller towns it is necessary to exert a reasonable and enlightened control over subdivision plats, but without the help of a large engineering department. These subdivision ordinances provide in the first place that all plats must be approved by the Town Planning Commission and that no land may be sold and no improvement put in until such approval has been secured. The ordinance then outlines the minimum requirements of the Town Planning Commission for the approval of plats. Specifications for the preparation of plans and for the placing of improvements are given.

Topography and all existing conditions must be shown, as well as the relation of the proposed plat to the present street system and to the official Town Plan. Furthermore, the plans for all the improvements must be submitted and approved.

No land may be subdivided unless it is feasible to put in water-supply and sewerage without unreasonable delay. Easements are required along rear lot lines where no alley is provided. Minimum sizes are specified for lots and maximum sizes for blocks. It is required that streets be so laid out as to make the continuation of existing streets convenient and to provide for the location of streets called for by the Town Plan. Curb corners must have radii of not less than 12 feet. Street grades must not exceed 5 per cent on through

traffic streets, nor 10 per cent on other streets. Pavement must be suitable. All wires along streets must be placed underground, wires strung on poles must be placed along the rear easements, and reasonable provision must be made for parks, playgrounds and schools. Finally, the subdivider must give consideration to the appearance of the subdivision within its own boundaries and also in relation to its environment in the town. Real estate operators subdividing land in these towns are very glad to maintain high standards by conforming to these regulations.

In considering ordinances of this kind, it must be remembered that the regulations must be varied according to the type, size, locality, topography and traditions of each town.

Ratio of Debt Limits to Valuations

By Basil F. Bickel

Of Bickel, Tietjen & Company, Investment Bankers, San Francisco

FROM the point of view of a banker or investor, the following elements of municipal financing indicate strikingly the weakness or the strength of a municipal investment, if the bonds have been legally issued:

1. Ratio of bonded debt to assessed valuation
2. Limitation or non-limitation of tax-levying powers of municipality
3. Conformity to legal restrictions and requirements governing them
4. Ability of borrowing municipality to pay
5. Will of municipality to pay
6. Legal enforceability of municipalities to pay where the moral desire to pay is questionable and the ability to pay is impaired
7. Character of the municipality, particularly as affecting stability of taxable values
8. Total debt resting on the municipal territory, including debt of overlapping municipalities, i. e., cities, counties, school districts, with practical reference to constitutional limitations upon the increase of this total debt

It is realized that with the elements prevailing in paragraphs numbered 1, 3, 6 and 7, the practically complete safety of municipal investment seems undoubted. It involves an extreme reverse in one of these

conditions to affect the general security of the obligation.

Debt limitation of the respective municipal subdivisions of a state is exceedingly important. On the face of it such limitations of the bonded debt in proportion to the assessed value of the real and personal property, essentially the former, indicate the general tenor of the conservativeness of counties, cities, towns, school districts, etc., in their fiscal management. It also rather graphically draws attention to the tax burden that the people in the community must bear. The debt limitation may be liberal, but that does not necessarily denote that the margin for bonded debt has to be fully exhausted. On the other hand, the limitation may be too frugal, and in many communities the purlindness of a community or a state in restricting to a very narrow point the limits of its municipal bonded debt has been reflected in the lack of progressive growth of those communities. It has been a case of robbing Peter to pay Paul. It is evident to-day that sidewalkless streets, lightless homes, poor water and sewer systems are not harbingers of prosperity or stable development, even among those who are prone to cling to false economy and inconveniences.

DEBT LIMITATIONS—COUNTIES, MUNICIPALITIES AND SCHOOL DISTRICTS

(See Additions and Exceptions below)

State	Counties Per Ct.	Cities Per Ct.	Towns Per Ct.	School Dis- tricts Per Ct.
Alabama (1)	3½	5-7	5-7	..
Arizona (2)	4-10	4	4	4-10
Arkansas (3)	..	..	..	..
California	5	15	15	5
Colorado (4)	6-1,2	3	3	3½-5
Connecticut (5)	5	5	5	5
Delaware*	..	..	..	..
Florida (6)	..	10	10	..
Georgia (7)	7	7	7	7
Idaho (8)	..	10	10	4-6
Illinois	5	5	5	5
Indiana (9)	2	2	2	2
Iowa	5	5	5	5
Kansas (10)	..	15	15	3-5
Kentucky (11)	2	3-10	..	..
Louisiana	10	10	10	10
Maine	..	5-7½	5-7½	..
Maryland*	..	..	..	..
Massachusetts (12) ..	..	2½	3	..
Michigan	3-5	8	10	15
Minnesota (13)	10	10	..	..
Mississippi (14)	10	10	10	10
Missouri	5	5	5	..
Montana (15)	5	3	3	3
Nebraska (16)	10	5	10	30
Nevada*	..	..	..	..
New Hampshire	..	5	5	5
New Jersey (17)	4	7	7	7
New Mexico (18)	4	4	4	6
New York (19)	10	10	..	..
North Carolina	8	8	8	8
North Dakota	5	5	5	5
Ohio (20)	..	5	5	6
Oklahoma (21)	5	5	5	5
Oregon (22)	6-8	..	..	5
Pennsylvania (23) ..	7	7	7	7
Rhode Island	..	3	3	3
South Carolina	8	8	8	8
South Dakota	5	5	5	5
Tennessee* (24)	10-15	(Roads)	..	..
Texas (25)	25	(Roads)	..	..
Utah (26)	2	4	4	4
Vermont	..	10	10	10
Virginia (27)	18	18	18	..
Washington (28)	5	5	5	..
West Virginia (29) ..	2½	2½	2½	2½
Wisconsin	5	5	5	5
Wyoming (30)	2	2	2	6

* Debt restricted by specific acts of legislature or city charter. Details not available.

Additions and Exceptions

(1) Three per cent additional for water, gas, electric, sewers.

(2) Fifteen per cent additional for water, light, sewers.

(3) Counties and cities cannot incur interest-bearing indebtedness. Financing done by discount warrants. Districts may issue bonds.

(4) Counties with assessed valuation more than \$5,000,000, .6 per cent; \$1,000,000 to \$5,000,000, 1.2 per cent; under \$1,000,000, no limit. No limit for water in cities.

(5) Water, gas, electric not included.

(6) Towns having charters, limit debt by charters.

(7) Laws require sinking fund for all issues.

(8) Water, light, power not included.

(9) County road extra.

(10) Counties only limited 1 per cent for bridges, 10 per cent additional allowed cities and towns for special improvements. Schools may double indebtedness by special permission.

(11) Three per cent additional for roads.

(12) Cities, 2½ per cent additional. Towns, 5 per cent additional for special purposes. (Boston not included.)

(13) Drainage, water, electric, etc., not included.

(14) Fifteen per cent additional for paving, water, gas, etc.

(15) Ten per cent additional for water and sewers.

(16) These limitations generally modified by special acts limiting bonds for special purposes.

(17) Based on average of three preceding valuations.

(18) Water, sewers, not included.

(19) Water not included.

(20) Water not included. Anticipation notes excluded; also bonds issued prior to April 12, 1902, and bonds refunding issues prior to April 12, 1902. Certain city charters allow other deductions.

(21) Water, electric, not included.

(22) Port districts, 10 per cent; cities generally limited to 15 per cent by charter. All counties limited to \$5,000 indebtedness, except 6 per cent for roads. Certain counties 2 per cent additional for other purposes.

(23) Philadelphia 10 per cent.

(24) Charters of most cities provide debt limit.

(25) Except for county roads, bonds not limited by percentage to assessed values, but by tax rates, which follow:

Cities 5,000 or more, \$2.50 per \$100 valuation for all purposes, debt and running expenses.

Cities under 5,000 limited to \$1.50 per \$100 valuation.

Counties 25 cents per \$100 valuation for general and current expenses, 25 cents for construction of permanent improvements; 15 cents for roads and bridges, and 15 cents additional for road and bridge maintenance, although county tax in any one year cannot exceed 80 cents or 8 mills for all purposes except for road improvement bonds.

Common schools, \$1 per \$100 valuation, half of which for sinking fund to retire bonds.

Independent schools, \$1.50 per \$100 valuation, of which 50 cents for bonds.

Constitution also provides annual sinking fund for all bonds, 2½ per cent levied annually. Bonds automatically limited by tax and sinking fund provisions to maturities of not more than 40 years.

(26) Cities 4 per cent, towns 8 per cent additional for water, light, sewers.

(27) Counties, population less than 300 per square mile, limited by special acts of Legislature. Personal property not included in determining assessed valuation, but being subject to tax, actually reduces debt limit to about 10 per cent in most counties and cities.

(28) Additional 5 per cent for water, light, sewers.

(29) Two and one-half per cent additional for roads.

(30) Four per cent additional for school districts to enlarge buildings, 2 per cent additional for sewers, 2 per cent additional for roads.

As may be noted, the accompanying table indicates in some instances wide latitude in debt-incurring ability on the part of municipalities in certain states. In reading the table, observe the general attitude of the state toward indebtedness for school facilities. Some are very liberal, while others are unusually frugal. It is also apparent that in some states where road building was not in vogue by counties through bond issues when the debt limitation statutes were enacted, amendments have been passed to allow such road indebtedness as additional.

It is also interesting to note that some of the lesser developed states allow their political subdivisions to incur a larger ratio of indebtedness to the assessed values, so as to encourage greater development. It is also argued that such states enjoy a greater ratio of increasing assessable values, and more liberal debt limitations are practical.

ACKNOWLEDGMENT.—Abstracted by permission from an article by Mr. Bickel, on "Bonds and Bankers," in *The Bond Buyer*, of New York, for October 18, 1923. The table is copyrighted.



GARDEN THEATER, WASHINGTON PARK, PORTLAND, OREGON
Showing first season's growth

Helping the Playgrounds to Serve the Full Purpose of Play

By Florence Holmes Gerke

Landscape Architect, Bureau of Parks, Portland, Ore.

THE playgrounds of the average American city are not playgrounds but outdoor gymnasia. Only half of the definition of play, "Play is the general term for exercise, physical and mental"—namely, the physical exercise—has really been handled in many of the playgrounds. The opportunity for mental exercise on the so-called public playgrounds is tremendously limited.

I have seen playgrounds in eastern, southern and far western cities where the play opportunity was possible only if one wished to swing from the traveling rings, hang by the knees from bars, or bat the soft playground ball about the grounds. Opportunity for mental exercise, the use of the imagination and all creative faculties, was practically negligible.

No fault should be found with the excellent physical training afforded by the grounds, but other recreation suitable to the outdoors should also be given recognition. This phase of the work is more generously handled in community houses, but grounds are often laid out with no thought but of the dimensions of the frames holding swings, teeters and other apparatus, and whether or not there is the necessary 235 feet for the official baseball diamond.

Giving the Dramatic Instinct a Chance

The dramatic instinct in small children is generally admitted to be real and strong. The love of dressing up and being some one other than one's self is so strong that even the successful broker has been known to don Roman senatorial robes and to enjoy the fancy-dress ball and his own naive appearance. People turn out in crowds to watch the lumbering floats in a parade where George Washington, Minerva and Hiawatha are more or less quaintly portrayed. The colleges array their candidates for graduation and their professors in robes which create at once a world of study and learning and are stimulating both to the participants and to the spectators. The church recognizes the dramatic instinct of the people. In fact, the appeal of the imagination seems so evident that it is surprising that the official centers of play do not provide for this most important phase of play—"mental exercise."

In most instances the playground director who wishes to put on a little play or pantomime has no place for such activity. There is not even a quiet green corner where the story hour may be held. Surely the tale of the Babes in the Woods is more vital if the listener is crouched on the grass at

the foot of some great tree with a leafy barrier cutting him off from pavements and houses and garages and other too real things. Half the battle in scenery and costuming for amateur theatricals might be solved by an informal garden theater or even a fairly secluded lawn with shrubbery screen and some shade.

The garden theater should have a place in a goodly number of the city playgrounds. This does not mean the stadium or Greek theater with masonry walls and seats, but a simple area depending on its greenness for its charm. Its uses are many and are not confined to one age or group. The neighborhood flower show, the harvest exhibit of prize vegetables, the bird-houses made by the boys, the Scouts' show of camping equipment and rites—all might appear more charming than they would be in some hall where pink and green and red bunting defy the flowers to show their charm or the camp-fires of the Boy Scouts to appear true, despite the aid of an electric light hooded with red crêpe paper. Fourth of July celebrations, the May-pole dance, the band concert, the awarding of prizes for crafts work and athletic prowess, might well find their way to this green grove.

In times when the theater is not in use for any show or entertainment it becomes a park for picnicking, resting, reading and informal play. A group of women may gather for the afternoon darning and mending in this area cut off from flying balls and acrobatic enthusiasts. The occasion at the theater will make life a little more intriguing, and the daily use of the plot will furnish a restful place for one type of "play."

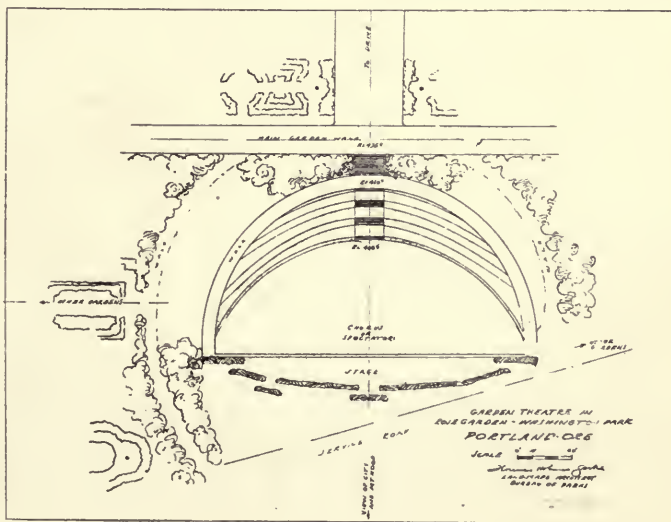
In giving the children and adults of a community a vent for their physical energy alone, the recreation officials are surely losing tremendous opportunity to teach some of the beautiful imaginative things. Summer hours are spent outdoors when possible, and they should be made to offer something in appreciation of beauty, closer contact with trees and grass and shrubs,

better knowledge of good things in dramatics, singing and dancing and such activities as are possible for groups. The right environment will solve much of the difficulty for advocates of these fine things who have the subject and the players but not the place to play.

Planning a Small Garden Theater

The building of a small garden theater calls for no great code of rules. Given the space, which will vary according to the community served, seclusion should be sought. If the topography gives this, the designer is fortunate, but ordinarily a comparatively flat area has been set aside for the playground, and the theater must fit into this scheme. If the ground is flat, the stage should be elevated, but a more pleasing arrangement is to have the seating space slope gently toward the stage, which then appears to be rather in a hollow. Shade is valuable in the theater which is to be used in the hot months. In fact, all planting should be studied with a view toward enriching the season of use—the summer, and shrubs which flower during these months should be selected for the screen planting. Evergreens may also be employed to give a year-round appearance.

The screen plantings should follow in general the effect given by the drop curtain and wings of the indoor auditorium, but should not be too set and formal unless the entire theater is given this treatment, which calls for special study. If the site chosen has trees and large shrubs, these



should be cherished and worked into the scheme whenever possible. Turf makes an excellent floor for the stage, and grassy banks are pleasant to sit upon, provided the area is well drained and the turf thoroughly established. On some sites it is desirable to have the park workmen bring in the benches for special performances. Masonry seats are not to be considered in this type of theater, which is arranged merely for the community and not designed to accommodate more than 500 persons at the most. The stadium idea should not be confused with that of the garden theater, which is planned for more intimate close-up productions than for the great shows, which must be done at huge cost and through much organization. At the back of the stage behind the shrubbery border there should be space for the per-

formers, and in case of change of costume, area enough to accommodate a tent for dressing purposes.

Several colleges have garden theaters. Country clubs and private individuals have built them. The Bureau of Parks of Portland, Ore., has recently completed the construction of a rather larger theater in its nine-acre rose garden in one of the important parks. Dunthorpe School, just outside of Portland, is contemplating a garden theater in connection with the school athletic grounds, where native shrubs and trees will be used.

The ready response of children and grown-ups to all manner of shows, dress-up entertainments, dramatic presentations and like activities shows the need for recognition of these interests in the general plans of the playgrounds.

Schoolrooms Where Colds Are Not

A statement published at the end of last winter in the Weekly Health Review of the Detroit Department of Health

THE other day a teacher in an open-air schoolroom said: "I have not had a cold this winter. I did not have a cold last winter. The pupils are remarkably free from colds. I have gained five pounds since teaching in the open-air rooms. Before I taught in this type of room I had colds all winter long."

There are six open-air schools in Detroit—the Russell, Stephens, Clippert, Marr, Maybee and Franklin. The temperature of these rooms varies from 55 to 60 degrees. The occupants wear heavier clothing, although some after a time get so used to their surroundings that they do not wear other than ordinary clothes. In the fall they gradually become accustomed to the cold air. The skin responds to the stimulating action of the cold. The membranes of the nose and throat are less subject to congestion and infection. The body becomes toughened to meet daily fluctuations in the weather.

The pupils in these rooms comprise non-

infectious tuberculosis, exposures to tuberculosis in the home, the severely malnourished and anemic, and a few children with heart ailments. They have a special schedule, including periods for sleep and rest and lunches. The total enrollment since July 1 is 621. On March 1 the enrollment was 416. Since July 1, 225 children have been discharged from the classes, 140 being so far improved in health as to return to the regular classroom. Six have been sent to a sanatorium for more intensive care, and 79 have been discharged for other reasons. The average attendance since July 1 has been better than 91 per cent.

In the matter of weight changes during February, 55 per cent exceeded the average expected gain, 7 per cent equaled average gain, 10 per cent gained, but less than the average, 10 per cent remained stationary in weight, and 17 per cent lost weight. Placing these children on their feet now will mean less dependency on sanatorium care later in life.

Municipal Progress in the Last Quarter-Century

COMMENTING on THE AMERICAN CITY'S editorial on "The Ghost of the Dog with a Bad Name" (pages 451-2, issue of November, 1923), Clinton Rogers Woodruff, President of the Civil Service Commission of Philadelphia and Honorary Secretary of the National Municipal League, expresses his point of view as follows:

"While there may have been some decline of popular interest in municipal questions, due to the aftermath of the war and international complications, I am convinced that there has been a very wholesome improvement in municipal

affairs. Administration has been so improved, the forms of government have been developed along so satisfactory a line and generally there has been such an increase in municipal efficiency that I feel that the statements that many of us made a generation ago no longer hold true. They unquestionably were well founded at the time, but since then, through the activity of organizations like the National Municipal League and publications like THE AMERICAN CITY, there has been a quickening of public interest and a development of public conscience, which has had the results just noted."

Prostitution: What a City Should Know About Itself

By George E. Worthington

Associate Director, Department of Legal Measures, American Social Hygiene Association;
Member of the New York and the Washington Bar

ASSISTANT SURGEON GENERAL C. C. PIERCE of the United States Public Health Service, in a previous issue of *THE AMERICAN CITY*, has pointed out that American cities are realizing the menace of prostitution and the necessity of its elimination.

More and more, local groups such as Chambers of Commerce, Community Councils, Rotary, Kiwanis and Lions Clubs, etc., are interesting themselves in the problem, and are seeking out means for eradicating this evil. The first step for such an organization to take is to make a thorough survey of local conditions. Just as a careful owner has his car examined and overhauled as an insurance against future trouble, so may a city very well indulge in community insurance by a periodical searching for weak links in its organization, missing parts, and the need of replacement or reinforcement.

The Under-Cover Investigation

The organization sponsoring the survey might best begin by the under-cover investigation. If prostitutes are so hard to find, either directly or through go-betweens, that the average man must spend considerable time, effort and money to locate one; and when he succeeds, if there is difficulty in finding a safe place to go to without danger

of the arrest of both of them, the organization may be confident that its community is satisfactory so far as law enforcement is concerned. If, however, prostitutes may be found without difficulty, in the streets, dance halls, cafés, parks, and in houses, apartments and hotels, or through the auspices of bell-boys, taxi-chauffeurs, porters,

etc., very little has yet been accomplished in the matter of law enforcement. The reasons for such conditions must then be ascertained.

A study of the laws, police and courts may indicate: that the laws are inadequate; that the police department is inefficient, corrupt, indifferent to the enforcement of prostitution laws, or perhaps undermanned, or not equipped with plain-clothes detectives to secure evidence of law viola-

tion; that the prosecuting attorney is uncooperative, indifferent, or without sufficient personnel; that there is no cooperation between the police and the sheriff's office or between the health department and the courts; that prostitution cases are scattered among a number of courts, where their importance is minimized by judges who are not expert in the particular problems involved, or who interpret the law in such a way as to make the gathering of convicting evidence practically impossible; or that cases are tried in a court whose judgments are not

Assistance Available from National Headquarters

Organizations in large cities may find it convenient to carry out a survey of local conditions in cooperation with the representative national organization in this field, The American Social Hygiene Association, as has recently been done in Cleveland, St. Louis, and Chicago. Smaller cities and those not easily accessible from New York may not find this practicable or convenient, and for them it is the purpose of this article to suggest a guide as to the type of inquiry that should be carried on and the most essential parts of the law-enforcement machinery that should be investigated. These fall into three general groups—the law, the police, and the courts, and a check thereon is provided by an under-cover investigation of environmental conditions.

final, because of a system of *trial de novo*;¹ and that the city or state lacks adequate facilities in the way of institutions or social machinery for the rehabilitation of sex offenders.²

Principles Applicable to Smaller Cities

While it doubtless is true that smaller cities will not find it practicable to provide all the machinery the outline implies, yet the general principles behind it will be applicable. For example, in place of a specialized court for sex delinquents, it might be arranged that all such cases be tried in one court and at a special time with the same judge assigned to all cases, so that he may become to a greater or less degree a specialist in the difficult problems involved. The finger-print system has, of course, greater value in a large city than in a small one. The principle involved, however, that the court should know all about the record of the defendant before sentence, is the important thing. No judge handling prostitution cases should be without a social, physical and mental record of each defendant before sentence, so that he may dispose of the case intelligently and with an eye not only to the interest of the public, but to the rehabilitation and restoration of the individual to society.

Study should also be made of the best methods of treatment of sex offenders. This involves a study of probation and probationary systems, physical and mental clinics, farm colonies, training schools and reformatories; also the question of parole from these institutions and the placing of the delinquent where he or she may once more become a useful member of society.

Protective Social Measures Important

In passing, it should be emphasized that protective social measures³ should not be neglected, on the theory that an ounce of prevention is worth more than a pound of

cure. Such are measures which are aimed at preventing the boy or girl from definitely becoming delinquent. These include the securing of a more thorough knowledge on the part of parents, community, schools and other like agencies of pre-delinquent symptoms in children—a better understanding of anti-social attitudes and behaviors in order that these may be corrected before they gain headway, and at a point in the individual's development where he is more pliable and responsive. Adequate playgrounds should be provided for children, and opportunities for young and old to use their leisure time wholesomely, so that there may be developed ideals of fair play and social responsibility which are inconsistent with the misuse of the sex instinct. Provision should also be made for the adequate lighting of public parks and benches, and the license and supervision of dance halls and places of commercialized amusement.

Facts to Be Presented at a Local Conference

When the community survey has been made and completed, a detailed report should be prepared, and a conference called of all the local officials concerned in the administration of sex delinquency laws. This, briefly, should include the mayor, director of public safety, director of public welfare, health officer, prosecuting attorney, city attorney, judges of courts having jurisdiction of such cases, sheriff, chief of police, chief of detectives, director of women's police bureau, chief probation officer, parole officer, juvenile authorities, and other similar officers. Arrangements can be made with the American Social Hygiene Association for the attendance at this meeting of a competent representative.

The facts should be presented at this conference and the differences between the various officials ironed out and team-work between them secured. It may develop from this conference that new legislation is needed. If so, the recommendations of such a body will have much weight with the legislature in providing for what is required. It may be valuable to continue the convening of such conferences at intervals. The important thing, however, is to secure team-work among the different officials; if this is done, success is sure to follow.

The following is an outline of the things to be inquired into:

¹ By this is meant a new trial in a higher court of original jurisdiction without any reference whatsoever to the trial in the court below. The *trial de novo* is a peculiarly American development in the criminal court system, now largely used by defendants as a means to thwart justice.

² Methods for remedying these conditions are suggested upon request, by the American Social Hygiene Association, 370 Seventh Avenue, New York City.

³ By social hygiene protective measures are meant all efforts official or unofficial in a community to keep or remove its youth from all abnormal pressure to indulge in sex relations before marriage.

I. Laws and Ordinances⁴

A. State Laws

Has your state laws on the following subjects:

1. Law for the repression of all forms of prostitution,⁵ for the penalizing of soliciting and offering to commit prostitution by both sexes?
2. Injunction and abatement law?⁶
3. Law making venereal disease reportable and providing for quarantine of persons who are a menace to the public health?
4. Law providing for the commitment and custodial care of feeble-minded sex delinquents?
5. Law providing for establishment and maintenance of reformatories and rehabilitative institutions for men and women and boys and girls, and providing for commitment thereto under an indeterminate sentence?
6. Law providing for removal of officers guilty of non-feasance or misfeasance in office?

B. City Ordinances

Has your city ordinances on the following subjects:

1. Ordinance requiring the licensing and supervision of hotels and rooming houses and forbidding the use thereof for purposes of prostitution, assignation or lewdness?
2. Ordinance penalizing the use of public vehicles for purposes of prostitution, and where possible for revocation of license?
3. Ordinance requiring the licensing and supervision of public dance halls and revocation of licenses for immorality therein?
4. Ordinance prohibiting closed stalls and booths in cafés, restaurants, saloons, etc.?
5. Ordinance for licensing and supervision and revocation of licenses of massage parlors, used for immoral purposes?

II. Investigation

1. Is there a Red Light District, i.e., a section of the city where open houses of prostitution are permitted to operate? If so, how many houses does it contain?
2. How many open houses of prostitution are there which are not segregated? Location?
3. In how many of the following places do prostitutes operate?
 - a. Hotels?
 - b. Rooming houses?
 - c. Streets?
 - d. Disorderly massage parlors?
 - e. Taxicabs, service cars and for-rent automobiles?
 - f. Public dance halls, cabarets, cafés, saloons, etc.

III. Police

1. Are there plain-clothes police to detect and arrest violators of laws against prostitution?
2. If not, what steps, if any, do police take to secure evidence of violation of laws against prostitution?
 - a. How is the department organized in this respect, i.e., central headquarters squad covering whole city, district squad, or a combina-

tion of both, namely, the centralized - decentralized system?

3. Are there any policewomen in the department?
4. Is there a detention home for women and girls—that is, a temporary place of detention, where they may be kept pending trial or permanent disposition of their cases?
 - a. Does it provide for the separation of first offenders and hardened prostitutes?
 - b. What is its capacity?
5. If there is no detention home, are the jail facilities adequate in the following respects:
 - a. Are the women segregated from the men?
 - b. Are first offenders segregated from hardened cases?
 - c. Sanitation, heat, light, air, congestion, etc.?
 - d. Jail matrons?
6. Are there any women protective workers, either in the police department or voluntary?
 - a. For doing case work among young girls to prevent delinquency, and to keep first offenders from entering permanently a life of prostitution?

IV. Health Department

1. Does the health department cooperate closely with the courts and institutions in:
 - a. The examination for venereal disease of persons confined in jails and detention homes?
 - b. The examination for venereal disease of persons convicted for sex offenses?
 - c. The quarantining of diseased persons who cannot be trusted to refrain from infecting others?

V. Courts

A. Uniformity

1. Is there a uniform court for the city for misdemeanants?
2. If there is a uniform or municipal court, are all sex delinquency cases tried in the same branch?
3. If there is not a uniform court, are all sex delinquency cases tried in the same court or scattered through several different courts?

B. Prosecution

1. Does the county or city attorney prosecute prostitution cases, or do the police prosecute their own cases?
2. Has the prosecuting or county attorney special vice-investigators at his disposal?
3. Is the county or district attorney enforcing the Injunction and Abatement Law?

C. Trial and Disposition

1. What checks are provided against the thwarting of justice, such as:
 - (a) the fixing of bail in such a sum and of such a quality as to assure the appearance of the defendant at the trial;
 - (b) granting a speedy trial, and denying frequent or long-time continuances;⁷
 - (c) the trial of such cases in a court which may make final disposition?⁸

⁴ Model laws and ordinances covering the subjects listed under this heading may be obtained upon application to the American Social Hygiene Association.

⁵ Prostitution, as here defined, means the giving or receiving of the body for sexual intercourse for hire, and the giving or receiving of the body for indiscriminate sexual intercourse without hire.

⁶ A civil action in equity to enjoin the continuance of the use of a place for the purpose of prostitution, and to abate the nuisance created by such use.

⁷ Large cities should have a specialized court for sex delinquency cases, with an expert on the bench, social machinery, facilities for mental and physical examinations, a finger-print bureau to provide a check on recidivists and adequate jurisdiction to make proper dispositions. Smaller cities should provide, so far as possible, for the trial of all of such cases in one court, so that the work of a specialized court might be approximated.

2. Are the trials summary or before a jury?
3. Does the judge interpret the law in such a way as to make the gathering of convicting evidence practically impossible, and is he inclined to minimize the importance to the public welfare of such cases?
4. Are adults eligible to probation and, if so, is the probation personnel adequate, both as to members and previous training?
5. Are there facilities for finger-printing convicted defendants?
6. Are facilities provided for the mental and physical examination of convicted sex delinquents and, if so, are convicted defendants remanded before sentence for a period of 48 hours, a minimum period necessary to accomplish such examination together with a social investigation and an examination of finger-print records, so that the judge may make an intelligent disposition of the case?
7. Are those convicted placed on probation, fined, or committed to an institution either reformative or penal?
 - a. Are fines nominal or large?
 - b. If the judge may in his discretion fine or commit, what proportion are committed?
 - c. Are the commitments for indeterminate periods or for short definite terms?
 - d. Are only first offenders placed on probation, or is the past record considered in applying probation?
8. Do appeals go to an appellate court for review or are they tried *de novo* in a higher court of original jurisdiction?
9. What is the relative success or failure of appeals in this class of cases?

VI. Coordination and Team-work: What Cooperation Exists

1. Between the police and the courts?
2. Between the police and the prosecuting attorney?
3. Between the police and the sheriff's office?
4. Between the courts and the health department?

* Delay in the trial of cases frequently results in the disappearance or non-appearance at the trial of important witnesses for the prosecution.

* The *trial de novo* is one of the most flagrant means for the defeating of justice.

"Well Born"—a Motion Picture Obtainable from the U. S. Children's Bureau

THE U. S. Children's Bureau has produced a two-reel film, "Well Born," which it is believed will meet the need, felt by all interested in the health of mothers and babies, for a simple and convincing presentation of the question of prenatal care.

The picture tells its story in a way which will interest and attract the average mother, whether she lives in a city apartment or on a farm. There is neither preaching nor scolding. The observer sees the experiences of two young couples, Sue and George, Mary and Dick, in learning first, the need for special precautions on the part of the mother during the period before the baby is born, and second, just what

those special precautions are. Each prospective mother happily puts into practise the things she learns through the maternity clinic, the family doctor, the county nurse. The picture takes a little less than half an hour in showing. The acting is intelligent and sympathetic and the photography is unusually good.

"Well Born" will be lent by the Children's Bureau to responsible persons and agencies with the understanding that the borrower defrays express charges back and forth, employs a competent motion-picture operator, and guarantees the safekeeping of the picture. Those who desire to purchase the film may apply to the Bureau for information and prices.

Mayors Cooperating with American Peace Award

IN reply to a letter sent in November to mayors throughout the United States, the American Peace Award announces that up to December 21 the mayors of 145 municipalities had arranged for special city committees to conduct the "referendum" to be taken throughout the country in January on whatever plan is selected by the Jury of Award.

In this letter the American Peace Award asked the cordial cooperation of the mayors in making it possible for every interested citizen in their respective communities to register his approval or disapproval of the plan selected. It requested that the mayors suggest to the American Peace Award the individuals or organizations in their communities who would best handle the referendum, or appoint a special committee to take the matter in hand.

In many of the cities the Mayor is serving as Chairman; in a number of places the com-

mittee consists of representatives appointed by the Mayor from such organizations as the Chamber of Commerce, American Legion, Rotary Clubs, Federation of Women's Clubs, League of Women Voters, etc., etc.

The headquarters of the American Peace Award (342 Madison Avenue, New York) are prepared to furnish in January, without charge, to local officials or organizations any number requested of copies of the text of the winning plan accompanied by a ballot which will have space for the signer's name and address, a statement as to whether or not he or she is a voter, and a statement as to whether or not he or she approves the winning plan in substance. The ballots may either be sent directly back to the office of the Peace Award or may be collected and analyzed by the local committee, organization or institution handling the matter and then transmitted to headquarters.

Chamber of Commerce Activities in Public Affairs

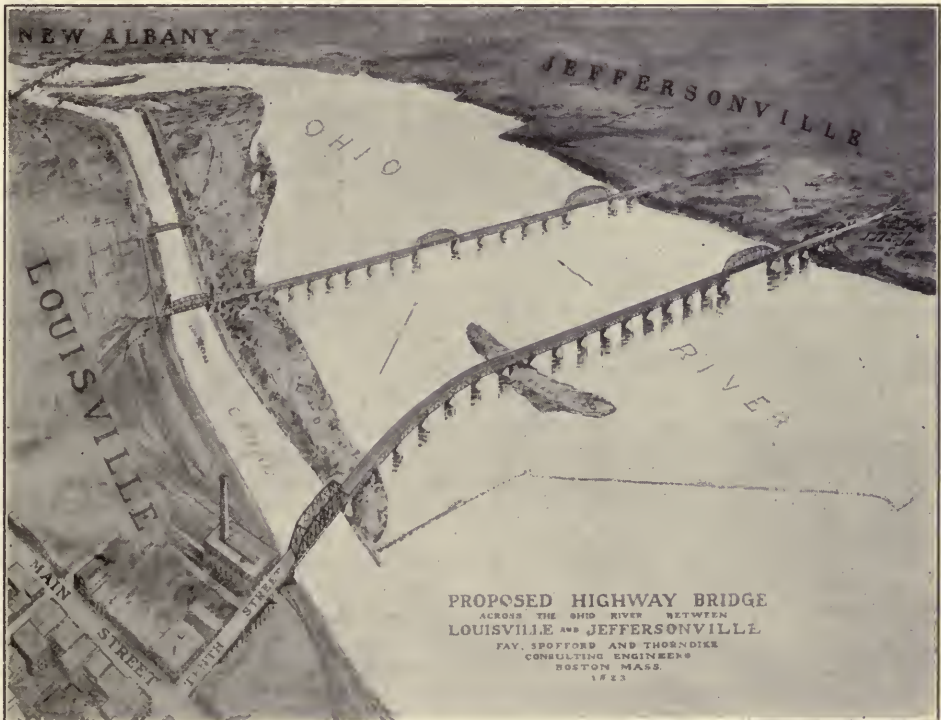
Board of Trade Committee Advocates Big Bridge Project

LOUISVILLE, KY.—Within the next few years, Louisville will be linked with the Indiana shore by a modern bridge for interurban, freight, vehicular and foot traffic, if the report made by a special committee of the Louisville Board of Trade is acted on favorably by the municipality.

After an inquiry touching upon the economic effect of the proposed bridge, its location, capacity and design; financial plan of construction and ownership; probable income; and character of operation of similar structures, the committee recommended that the Board of Trade "urge the city authorities of Louisville to build the bridge as a practical and economic venture."

At present Louisville is connected with the Indiana shore by three bridges, one of which carries railroad traffic exclusively, the second carrying railroad and interurban traffic, and the third, railroad, interurban, automobile and foot traffic. Pointing to the need for the bridge recommended, the committee reported its belief that "the mere provision of the facility at a point where the great through highways of Indiana now under construction meet similar highways building in Kentucky will bring a tremendous monetary reward to the people of courage and vision who built it."

Detailed recommendations as to the location and the kind of bridge to be built were made a part of the report. Before submitting its findings, the committee had the



PROPOSED HIGHWAY BRIDGE ACROSS THE OHIO RIVER BETWEEN LOUISVILLE AND JEFFERSONVILLE

benefit of recommendations made by Fay, Spofford & Thorndyke, bridge engineers of Boston, who were retained by the Board of Trade to study the local situation.

The committee's report, adopted by the Directors of the Board of Trade and referred by them to the city, recommends a bridge to cost \$5,630,000. The proposed method of financing includes the formation of a municipal bridge corporation, the securing of state and national legislation to permit the city to bond the project and construct the bridge, and the levying of tolls which eventually would pay for the cost of construction, carrying charges and maintenance, at which time the tolls could be reduced. The report recommends a toll of 25 cents for the crossing of an automobile and driver, the same toll now in effect on the only bridge which accommodates vehicular traffic.

The thoroughness with which the Board of Trade committee studied the subject and the soundness of its recommendations brought forth unanimous editorial commendation from the local press.

W. E. MORROW, Secretary,
Louisville Board of Trade.

Cooperation Between Newspaper and Chamber of Commerce

ILION, N. Y.—Cooperation of unique sort is being received by the Ilion Chamber of Commerce from the weekly newspaper, *The Community Review*, which is published by the Citizen Publishing Company of Ilion. This sheet, the only tabloid newspaper in Central New York and probably in all of New York State with the exception of one in New York City, is the outgrowth of one daily newspaper, suspended, and one weekly newspaper, likewise discontinued. Immediately after these papers were stopped, a publication called *The Booster* was published by the concern at the advice of business men and the Chamber of Commerce. Charles T. Rea, Secretary of the Ilion Chamber, was one of the first to promote the welfare of *The Booster*, contributing short, well-written articles on local matters of considerable interest which were carried in each issue of the publication.

The Booster lived about a year, until it was decided, with Mr. Rea's help, that a newspaper should be re-established in Ilion. Conferences between Theodore W. Schmidt,

President of The Citizen Publishing Company, and the writer, now managing editor, evolved the make-up and general policy of the new publication. It was decided then to devote at least one column to a review of Chamber activities and purposes each week, a feature of the new publication which has met with general commendation.

SAMUEL H. ALLSTON,
Managing Editor, *The Community Review*.

Mourning for a Deferred Demise

LAFAYETTE, LA.—In mourning for the defeat of the bond issue for a new court house, voted down by the citizens of Lafayette at a special election a short time ago, the antiquated court house was draped in black, and "In Memoriam" cards bearing an appealing message were displayed. These

IN MEMORIAM

I have labored long and faithfully and have grown very weary of waiting for the well-earned rest an ungrateful people have denied me.

I deserved a better fate at their hands, and therefore I mourn—while taking refuge in the thought that, "as long as there is life there is hope."

THE OLD COURT HOUSE

cards, one of which is reproduced herewith, were printed by the Chamber of Commerce, and were hung on the pillars in front of the old building, with bands of black crepe draped above them. They also appeared in prominent positions along some of the main streets of the city.

The court house in mourning did not fail to attract considerable attention from the people of the community, and it is hoped that through this unusual method of appeal the real need for a new building was firmly impressed on many of the onlookers. The results of this effort will be seen when the new drive for the bond issue is made in 1924.

H. B. SKINNER,
Executive Manager, Chamber of Commerce-Community Service of Lafayette Parish.

A Small City's Pageant of Progress

DINUBA, CALIF.—On August 15 last the city of Dinuba celebrated the completion of 160 blocks of paving and the installation of electroliers on 91 blocks. This city now claims the distinction of being the best-lighted city of its size in the world. Representatives from cities in all sections of the state came to participate in the celebration, and large delegations were present from a number of the neighboring communities. It is estimated that 20,000 people were in attendance.

The principal event of the evening was the Pageant of Progress, in which Benjamin Franklin presented the Queen of Electricity with a spark from his kite. By the touch of the Queen of Electricity the city became illuminated with more than 400 modern electroliers. Another interesting feature of the celebration was the first conversation over the Grant Park telephone line, when Colonel White, Superintendent of Sequoia and General Grant National Parks, expressed his pleasure at the completion of telephone connections between the park and the people in the valley. In addition, there were many carnival attractions, an illuminated parade, vaudeville performances, band concerts and a street dance.

E. E. WIKER,
Secretary, Dinuba Chamber of Commerce.

Big Improvements for Small City

MONROVIA, CALIF.—Following a strenuous campaign conducted by the Citizens' Committee of Monrovia, comprised of the presidents of all local organizations, a large bond issue for municipal improvements was carried by the voters at a recent special election. The principal item in the program provided for by the bonds is the improvement of the present water-supply system, on which it is planned to expend \$180,000. The other items are as follows: \$80,000 for the improvement of the recreational park and swimming pool; \$16,000 for the construction of a new bridge on Hunting-



A PART OF THE CROWD WITNESSING DINUBA'S PAGEANT OF PROGRESS

ton Drive over the Santa Anita Wash; and \$50,000 for the building of an addition to the City Hall. Monrovia has also recently acquired a site for a civic center.

FRANK J. WIFFLER,
Executive Secretary, Monrovia Chamber of Commerce.

State-wide Conference on Public Health

SAVANNAH, GA.—Realizing the great need for better health conditions in the state of Georgia, the Public Health Committee of the Savannah Board of Trade recently organized the State-Wide Health Association of Georgia. This was the first meeting of its kind ever held in this state and it attracted considerable attention among the members of the medical profession and those interested in matters concerning public welfare.

The principal speaker of the meeting was Robert F. Maddox, Chairman of the State Board of Health and one of the leading business men of the state. In his address he stressed the point that if Georgia is to progress industrially, commercially and agriculturally, the business men of the state must give serious consideration to the eradication of preventable diseases. Prominent physicians and laymen from all sections of Georgia and officials of the United States Public Health Service were present and addressed the conference.

E. B. WALKER,
Manager, Savannah Board of Trade.

Getting Money for Small Houses

By J. Horace McFarland

President, American Civic Association

AT the Ninth National Conference on Housing in America, held in Philadelphia, December 5, 6 and 7, 1923, more emphasis was laid on the promotion of the building of small houses than on any other subject. This emphasis related to the need not only for the small house, but for so simplifying construction and financing as to put the small house within reach of the men and women who need it.

In his address at the conference, on "Labor's Position on the Housing Question," Hugh Frayne, the General Organizer of the American Federation of Labor, after speaking vigorously on what he termed "excessive land values," and denying that excessive wage costs were responsible for the high prices of small houses, made a definite proposition in the financial direction. He said that the laboring men of the nation had on deposit in savings banks in the United States enough resources to finance the building of all the houses needed. He proposed the withdrawal of these savings from the banks to the extent necessary to create a revolving fund, to be loaned for the building of homes by a mechanism to be established, into the detail of which he did not enter.

It seems only proper to call attention to the fact that precisely this mechanism now exists, and that it is largely patronized by the very persons whom Mr. Frayne properly desires to benefit. Because they do not beat the drum of publicity, the various building and loan associations of the country, immense and beneficial though their transactions are, escape the attention they deserve. They have more capital than have the national banks of the country, running into many billions of dollars, and in Pennsylvania alone, one of the states particularly using this form of cooperative effort, their assets increased \$77,000,000 in 1922, and aided in building or buying 51,000 homes. Another speaker at this memorable conference, himself the secretary of several building associations in Philadelphia, tersely described these organizations as "mutually cooperative money-saving and money-lending organizations."

In its best form, as largely exceeding all other forms, the building association uses the financial talent of a dozen or more men of success with little or no charge, paying to administer very large sums of money only the bare clerical salaries of a few necessary continuous employees. Under this ideal the average expense is somewhat less than one per cent of the yearly transactions. Building associations, too, are notably safe, because they have this constant citizen supervision in addition to regulation by the banking departments in the various states, somewhat more sharp and drastic in most cases than that given to the banks.

How Building and Loan Associations Operate

For the information of those who do not understand the building association idea, a typical Pennsylvania organization may be briefly described. Its directors and its friends make themselves shareholders on the basis of \$200 per share. This is paid for in installments of \$1 per share per month. The money thus paid in is immediately loaned for home-building or purchase, and only as secured either by first mortgage on approved, conservatively valued real estate or by government bonds or by stock in the same association which has a cash value in excess of the desired loan. On these loans 6 per cent is paid, but it is paid monthly, and not annually or semi-annually. This permits the constant reinvestment of the interest as well as of the monthly-paid installments on the principal of the shares.

This rapid money turnover under reasonable management results in accumulating from the dollar-per-month payments, \$200 in about 143 months, at which time the shareholder receives that sum in cash if he is an investor. If he has borrowed money from the building association on real estate security or the other security mentioned, to the extent of all or any part of the shares he has taken, then obviously when his accumulation period shall have passed, money will be ready to pay off his

loan, and that is done. In the operation of this association, the shareholder can withdraw all his money at any time without penalty or disadvantage, save that, instead of receiving—as is the actual fact should he remain in during the whole period of a little less than twelve years—about 6.6 per cent on his investment, he receives but 5 per cent for the shortened period.

Putting this in another fashion, the investor saves money at the rate of a dollar a month for each share of \$200, and all his savings are available to him at any time in full with 5 per cent average interest for the time he has been accumulating it, while if he stays by the game for the nearly twelve years necessary, he receives 6.6 per cent on all he has paid in, which squares his 143 payments to a \$200 cash value. The borrower, however, also gets the same advantage, and in addition to the enormous satisfaction of constantly reducing his loan by monthly payments, he finds that he has carried that loan for a little less than 5½ per cent during this whole period.

In this same practise the charges for negotiating loans are standardized and made small. Usually they are less than \$25 for an average transaction, which includes the search of the title, the drawing of the papers and the fee to the examining committee.

The same organization above used as an example issues also full-paid stock, because there is always a great demand for money, and it will sell this stock in \$200 units, on which it pays semi-annual interest at 5 per cent per annum, provided the money is left with it at least one year, but the shareholder may usually cancel his share and get all his money and his interest at very short notice.

Saving for a New Automobile

The principle of accumulation in small sums for definite purposes works out in this relation for a man who is saving for something else than a home: If he is wise enough to consider that his automobile is depreciating a very definite sum each month, and if he will invest that sum with a building association, he can always have his money at hand plus the interest earned, for getting a new machine in connection with the value of his old machine.

Now I have made this explanation of the existing building association relation because it seems to indicate that there is no least necessity for multiplying a similar agency or mechanism for promoting the building of small homes. I presume Mr. Frayne is not himself familiar with the beneficent operations of building associations. If he should within his group of interests start such a service, he would inevitably have to organize the mechanism and acquire experience, and experience is an expensive thing to buy. Also, unless he provided legal safeguards at the very outset, the chances that the money would sometimes go wrong would not be negligible.

Why Not Make Postal Savings Funds Available for Home Building?

At the housing meeting above referred to, it was brought out that the Government had \$138,000,000 of postal savings which it was loaning to approved banks at 2¼ per cent, paying the postal savings' depositors on withdrawals 2 per cent. With the usual strong demand for building money, any healthy building association cheerfully borrows money beyond the contributions of its shareholders at 5 per cent, and can comfortably keep house so doing by reason of its low expense ratio, even though it charges not more than 6 per cent for the loans made to its shareholders. It would seem a very reasonable thing to suggest to the Federal Government that it could greatly increase the return to the taxpayers in its postal savings fund by turning over this money, not to the banks, but to the building associations. In fact, it would not be an impossible thing to propose to the Government that it loan this sum of money—not a very great sum compared with home needs—ear-marked for the building of small homes only, meaning those costing not more than \$5,000; the cost of the money to the building association not to exceed 3 or 4 per cent, and the cost to the borrower not to exceed 5 per cent. The money would be at least as safe, when invested in carefully approved first mortgages, as it can possibly be in the hands of any bank.

All this is respectfully commended to the attention of Mr. Frayne and others who are sincerely anxious, as he is, to promote home owning.

The Community Spirit--A Tale of Two Towns

By Joseph Ernest McAfee

TWO towns lie close to each other. Nobody thinks of them in the same connection, except when he is studying geography. They have similar resources. They are of about the same age. The individual citizens are not greatly different; they belong to the same racial stock; they and their fathers hail from the same general sources; their traditions are similar. But if I should name the towns, those who know them would laugh to think that anybody should mention them in the same breath.

The only fundamental difference is that one is a community and the other is—well, it is a town, has a post-office and some stores, draws on the farms round about for its economic resources, and furnishes a sort of market for the farmers and their families. Though the municipalities are both comparatively young, there are already marked economic differences. One is all prosperity; business has its ups and downs, but the ups are usually high and the downs are rarely low. The other's ups scarcely appear above the surface nowadays, and its downs hit the bottom with a thump every little while.

One has more blocks of paved street than any other town of its size in all the region. The schools are simply corking; they secure superintendents with a reputation. Everybody is proud of the spruceness of sidewalks, front-yards, yes,—praise the Lord!—and back-yards, the parkings of the streets, the creditable buildings in the business section, the hotels—pretty much everything.

In the other town most of the folks drag along unpaved streets as though the day of judgment were about to dawn. They may well be in some anxiety, for if the day of judgment catches them in their present condition the eternal powers may consider it only a step to the next worse place, and send them on without much ado.

In one a group of citizens responded on a few hours' notice by the 'phone who feel it their business to get together about the

common interests. This group have a sort of official status, but they hold no arbitrary power. They are the community's spirit epitomized. They cannot coerce anybody into anything. They include both men and women, people with ideas and identified with affairs in the town—all kinds of affairs. They were selected because they touched every line of business and every social group and every bent of mind. The chairman is a woman, but their program is not feminized. The men have ideas and express them. The women think and talk about real things; not bridge whist alone, but quite as intelligently about the bridge over the creek on the outskirts of town.

In the other town it is impossible to get any sizable group of citizens together to consider community affairs. There is such a confirmed tradition for scrambling each for himself and all he can get, that not long ago the leading family of the town, in high office and in custody of a large block of the public funds, were brought to the dock under state authority with an empty pigeonhole where there should have been some twenty thousand dollars of the municipal securities. Consequently such an atmosphere of gloom and bitterness and abject discouragement could probably not be found this side of Miltonic doom. Hardly one citizen could be found who evidenced a spring of hope, since the collapse of the "best family" and the loss of the public funds.

In the first town there is one citizen who makes a success of his business, but who is sought by the perplexed and discouraged for miles around simply to help them to think through their problems. He is perpetually on the job. He serves on so many committees that they may soon have to carve on his headstone "Committed to the Grave." But it will be an honored tomb. Nor is he alone; not by several hundreds. The citizenship is standardized around that ideal. One cannot be said to have established the standard. Everybody conspired to establish it. That is the kind of folks

who live in that town. They take the bumps of fate together, and come out of the ditch together. When the fondly fostered local college collapsed, as the tendencies of the times seem to fate many such to do, the citizens accepted the inevitable with fleeting tears and converted the bankrupt plant into a hospital, which it soon appeared they needed worse than a half-baked, second-rate college, anyway.

In the other it is impossible to muster the public spirit to line five continuous blocks with shade trees in straight rows and of uniform genera and species. When the individual citizen spruces up his premises, paints his house, mows his lawn, landscapes his place with trees and shrubs after a fashion to show that a householder of intelligence and self-respect takes himself seriously, like as not the next-door neighbor devotes his back-yard to a pig-pen and a cow-lot, and uses the front as a chicken-run.

There is no substantial difference between the two towns; that is, they have much the same material substance to work on. Yet, in one, to hear the citizens talk,

you would think they were bound for the New Jerusalem and believed they were about to arrive. In the other, you conclude, along with everybody else, the place is going to the dogs, if it has not already virtually arrived at a worse destination.

The difference is spiritual. That is, it lies in the minds of the people themselves. One town has the community spirit. It knows—what ought to be clear to everybody by this time—that each gets on best and farthest when he sees that his neighbors get on. The other has converted community life into a scramble each for himself, with the other fellow turned over to the tender mercies of the devil. As a consequence, the devil is about to get all of them.

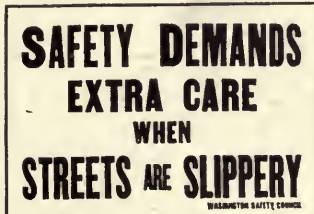
When we get *community* into our minds we shall have substantial and real communities spread all over the landscape. Land and water and metals and building materials are not the essential stuff of communities. There is enough of that kind to make out, almost anywhere. The real stuff of the community lies in the mind. Have you the community spirit? That is always the last, and generally the first, question to ask.

Posters and Publicity in Safety Campaign

CIVIC organizations desiring to conduct campaigns for greater safety in the streets of their respective cities may obtain from the Washington Safety Council, Fourteenth and G Streets, N. W., Washington, D. C., specimens of bulletins and posters of exceptional value. Three of the posters are here reproduced. In addition to the use of its own printed matter, the Council has been distributing to the

school teachers of Washington copies of Bulletin 1922, No. 32, of the U. S. Bureau of Education, entitled "A Program of Education in Accident Prevention, with Methods and Results."

Another activity of the Washington Safety Council is a "Safe Drivers' Course," open to the public, and conducted in high school auditoriums on six successive Tuesdays.

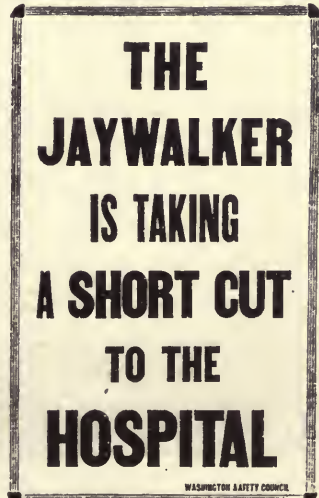


WORDING OF OTHER POSTERS:

BLINDING HEADLIGHTS
ARE DANGEROUS—UNLAWFUL
HOW ABOUT YOURS?

BETTER
LOSE A MINUTE
THAN
LOSE A LIFE

WHEN CROSSING A STREET OBEY
THE SEMAPHORE
LISTEN FOR THE WHISTLE



Aerial Mapping of New York City

By Sherman M. Fairchild

President, Fairchild Aerial Camera Corporation, New York

THE flying program for the aerial photographic mapping of the entire city of New York has been completed. Three planes flew approximately 3,000 miles, and the entire Greater City of five boroughs,—Manhattan, Bronx, Queens, Brooklyn, and Richmond,—a territory of approximately 625 square miles, has been mapped. More than 2,000 exposures of the Fairchild automatic aerial camera were necessary.

High-altitude photography played a big part in the making of the map mosaic. A Fokker C-2 camera plane, which was purchased especially for this mapping contract, flew consistently over the territory at an altitude never less than 16,000 feet—too high to be seen with the naked eye. A short focal length camera was used to take photographs at a very small scale for checking control.

The map pictures the city with the minutest detail. It shows every structure from contractor's temporary tool-shed to sky-

scraper; back-yards, gardens and parks with every tree and bush visible; avenues and alleys, streets and unrecorded foot-paths; big league ball parks; water-front clubs, with their yachts and motor boats; the boardwalk of Coney Island, and crowds of people appearing like small black dots. Even the congestion of traffic on busy thoroughfares is clearly shown.

In going over the preliminary plans for this map, the Fairchild engineers decided that two distinct maps must be made. The first covers an area of approximately 400 square miles within the official city limits at the scale of 1 inch to 600 feet, to be delivered in 140 sections, each section being about 14 x 21 inches. They are to be assembled in groups of four to correspond with the 35 sectional plan maps as laid out by the Board of Estimate and Apportionment. The aerial map will be used in conjunction with these official sheets. If made in one section, this map would measure approximately 22 x 24 feet.



CAMERA-EQUIPPED PLANE AT WORK OVER NEW YORK

The second map is even larger and is being made at the scale of 1 inch to 2,000 feet. It covers an area of about 625 square miles, including the city proper as in the first map, and also portions of the counties of Westchester and Nassau in New York State and part of the state of New Jersey. The completed map on this small scale will measure 10 x 8 feet. It is interesting to note that if this larger area were mapped at the scale of 1 inch to 600 feet, the map

would measure about 27 x 30 feet.

The contract for this mapping work was awarded to the Fairchild Aerial Camera Corporation by the city of New York on July 10, 1923. Delivery of the completed map must be made, under the terms of this contract, by April 15, 1924. Fifteen Fairchild engineers and surveyors are checking the controls and assembling the maps, working in conjunction with an inspector from the City Engineer's office.

Letters to the Editor

Continued Usefulness of City Planning Exhibition

TO THE EDITOR OF THE AMERICAN CITY:

Many of your readers who cooperated in 1913 in furnishing material for the American City Bureau's Exhibition of American and Foreign City Planning will doubtless be interested to know something of the recent history of the Exhibition overseas.

As you well remember, you sold it for a nominal sum to the Y. M. C. A. They were going to use it in connection with their work for the Army Educational Corps, but this work was cut short because of the unexpectedly quick return from Europe of most of the American troops.

During my work in France in the spring of 1919, I asked the Y. M. C. A. where the Exhibition was. They said they did not know, but they gave me carte blanche to find it. After much searching, I finally discovered it in behind mountains of merchandise at the docks at Bordeaux. I pried it loose and had it sent off to Paris, and at my request the Y. M. C. A. turned it over to a French educational and welfare group, La Renaissance des Cités. We had it on exhibition first, in Paris, in the Musée des Arts Decoratifs, which, as you know, is in the wing of the Louvre. We had French captions put on most of the mounts. A large number of people came to see it. It then went down to Lyons and to various other cities, and is now at the Institution Geographique et Historique, at 29 Rue Sevigné. It is still in good condition.

Coming at the time it did, just as France was starting the operation of her new compulsory city planning law, it proved most timely and decidedly useful.

GEORGE B. FORD, President,
National Conference on City Planning.

Memorial Auditorium Proves Its Value

TO THE EDITOR OF THE AMERICAN CITY:

In your issue of November, 1921, you published a picture and description of the Lowell Memorial Auditorium, then under construction. Your readers may be interested to learn how popular and useful the Auditorium has become.

During its first twelve months of use the Auditorium has been the scene of 194 different attractions, with a total estimated attendance of nearly 350,000. The programs have included many noted lecturers and musical artists, as well as a Home Beautiful Show, a baby show, a public wedding, a fruit and vegetable exhibit, an exhibition of the blind, political rallies, city, state, national, Chamber of Commerce, Rotary Club and Ad. Club meetings, memorial exercises for the late President Harding, community dancing, labor mass meetings, free educational lectures, free educational musical recitals, conventions, St. John's Hospital ball, Guild ball, Legion ball, Rotary ball, free band concerts, firemen's ball, police ball, and many banquets.

For the coming season a large list of high-class artists have already been booked, including Sousa's Band, Mary Garden, Ruth St. Denis and Ted Shawn, Maria Jeritza, Madame Pavlowa, John McCormack, Frieda Hempel, the San Carlo Opera Company, Madame Butterfly, Efrem Zimbalist, Madame Schumann-Heink, besides over twenty lectures and concerts furnished through the Moses Greeley Parker Fund, free to all Lowell citizens.

If any citizen of Lowell had doubted the advisability of building the Lowell Memorial Auditorium, he has certainly changed his mind during the past year.

GEORGE F. WELF, Secretary-Manager,
Lowell Chamber of Commerce.

Progress of City Planning Law During 1923

Frank B. Williams, author of "The Law of City Planning and Zoning," has undertaken to prepare for this magazine an article summarizing the judicial decisions and legislation with relation to city planning during the year 1923. Mr. Williams' book appeared in December, 1922, and his article to be published in the February issue is in effect a supplement to it, bringing it up to January 1, 1924. The zoning features of Mr. Williams' book are kept constantly up to date through his monthly department of "Zoning Notes" in THE AMERICAN CITY.

Operation Records for Small Water-Works

By Earle L. Waterman

Associate Professor of Sanitary Engineering, University of Iowa

THE records which ought to be kept at a water-works plant should show all facts relating to the operation of the plant. In a broad sense the keeping of such records may be called bookkeeping or accounting. Properly kept records, however, will not only show costs of operation, but will also show pertinent facts in regard to the quality of the product and point to reasons for variations in quality. A successful water-works plant is one which supplies water that is satisfactory from every standpoint to its customers, and also gives good service at a minimum cost. The facts in regard to the operations of such a plant should be kept in permanent form so that they may be always available. We profit by experience; the operating records should be a complete record of experience obtained in operating a water-works plant. When it is too late we often find that the memory of the plant superintendent is not as trustworthy as a written record.

The operating records should include an inventory of all plant equipment, a record of the amount of water furnished to the distribution system each day, amount of power used per day, pressure maintained, occurrence of fires, labor costs, plans of the distribution system, all changes in the distribution system, installation and removal of meters, meter testing, quantities of chemicals used for treatment, data concerning treatment, and the results of the examination of all samples of water which are analyzed to determine the quality. It is probable that other items should be included; this is not a complete list by any means and is offered only for the purpose

of suggesting what the writer has in mind when he uses the term "operating records." It will be noted that, aside from labor costs which are a factor of operating costs, the financial items are not included, and the reason for this omission is that such records do not always come under the province of the superintendent of water-works. It is not our purpose to discuss the important matter of the determination of water sales rates.

Records of Value to Plant Operator

The operating records should be of the greatest value to the plant operator. Such records ought to enable him to operate the water-works plant in the most efficient manner. The efficiency of the plant units as well as the efficiency of the plant as a whole can be determined. If the plant is not operated continuously, a study of the operating records should show at what times and for

Records as Essential in Small as in Large Plants

The value of operating records in large water-works plants is accepted without question, and the forms in which such records are kept are becoming more standardized each year. Is there any factor that depends on the size of a water-works plant which determines whether or not operating records are worth keeping? It is the purpose of this paper to point out the value of operation records, to discuss the existing situation, and to suggest methods of improvement.

how long a period the plant can be most economically run. It should show him the variations in quantity of water available at the source of supply and the variation in ordinary demand, together with the effect of fire demand. The record would show the effect of the seasons both on the quantity and quality of water and on the plant and distribution system. Some one will say that the old operator knows these things. In a general way this is true, but such information cannot be as reliable as the written record, and the new man coming onto the job does not inherit his predecessor's memory! Properly kept operating records should be invaluable to the man who makes them.

The making out of reports to a state board of health and to a state public utilities commission will be very much easier for the man who keeps a daily record of his plant operation. These state supervisory authorities are not unjust in their requests for information. The object of such supervision is to protect the health and the pocketbook of the citizens of the state. Speaking only from the standpoint of the water utilities, we must admit that the primary function of such public utilities is, first, to furnish a safe and satisfactory water, and, second, to supply such water to the consumer at a reasonable cost. Then the question arises as to who is to determine whether or not these requirements are being fulfilled. The consumer knows whether or not the water is satisfactory, but he is a poor judge of its safety and has very little knowledge on which to base an opinion as to the cost. Safety and cost are matters to be determined by specialists, and for the small water-works the services of qualified experts in such matters are frequently not feasible from an economic standpoint. When such advisory service is furnished by the state, plant operators should realize its value and by hearty cooperation obtain maximum benefits from it. Operating records make such cooperation possible and not a burden.

Provision for Extension

Most small towns and cities have the laudable ambition to grow, and history shows that a majority of them do increase in size. Growth means enlargement, extension and improvement of the water-works plant. When these matters come up for consideration, the first inquiry made by the engineer who is to make the plans is for the past records of plant operation. On the basis of such records he is able to forecast more accurately the probable future demands and plan for a plant that will furnish a safe, satisfactory and economical water-supply. The degree of success which he attains will be largely measured by the data which he finds avail-

able. Operating records are valuable in planning improvements to the water-works plant.

At a majority of the water-works plants in Iowa where some form of purification process is used, operating records are being kept. The Chief of the Water Laboratory of the State Board of Health has been making a very commendable effort during the past two years to encourage the keeping of such records. If the plant operator keeps only a duplicate of the weekly reports which are required by the State Board of Health, he will at least have a fair start on a system of operating records.

Use of Recording Devices

Perhaps the most serious obstacles in the way of getting operating records at small water-works are, first, lack of proper equipment and record forms, and, second, the fact that in many cases the operation of the water-works plant is only a part of the duties of the man who is city marshal and superintendent of streets. Probably not more than one-fourth of his time is devoted to the water-works. With so many things to claim his attention, it is not surprising that he does not keep records at the water-works.

If such records are to be obtained, it is essential that simple forms be planned and, further, that some equipment for measuring pressures and recording the amount of water furnished by the plant be installed. A recording pressure gage will be very helpful to the operator. Venturi meters or master flow meters may be used to determine the daily flow. If it is not possible to install a meter, a stroke counter on the pumps at pumping-plants may be used. Where the plant is not run continuously, the time of starting and stopping should be recorded. In the smaller plants the furnishing of a diary or log in which daily notes can be made may serve to encourage the operator to make some records.

ACKNOWLEDGMENT.—From a paper read before the Iowa Section, American Water Works Association.

CIVILIZATION AND HOUSING

Civilization can never be aught else than a mockery and a sham to the family which is not provided with a wholesome dwelling in which to live. It is on the family unit that civilization is built, and the future will not be safe for civilization until great housing and town planning programs are fully evolved and resolutely carried through to success in every country throughout the civilized world.—Henry R. Aldridge, Secretary, National Housing and Town Planning Council, of England.

Motor Equipment in Service at Home and in Distant Lands



AN AHRENS-FOX DOUBLE-BANK CITY SERVICE TRUCK DELIVERED TO THE CITY OF BRAINTREE, MASS., AFTER BEING EXHIBITED AT THE FIRE CHIEFS' CONVENTION, RICHMOND, VA.



A FOAMITE-CHILDS DOUBLE COMBINATION CHEMICAL AND HOSE CAR MOUNTED ON A REO CHASSIS, OWNED BY THE VOLUNTEER FIRE DEPARTMENT, ORISKANY, N. Y.

The equipment of this outfit includes two 40-gallon chemical tanks, 200 feet of chemical hose, 4 hand extinguishers, 1,000 feet of regulation fire hose, one 24-foot extension ladder, and one 12-foot roof ladder. Oriskany plans to install an automatic fire alarm system covering all parts of the village



THE MOTOR EQUIPMENT IN USE BY THE ROAD DEPARTMENT OF THE CITY AND COUNTY OF HONOLULU

The total number of motor vehicles now owned by the city and county is 78 and their gross valuation without depreciation is \$203,277.80. They are distributed as follows throughout the various departments: shop, 2; attorneys, 1; building inspector, 3; engineers, 6; electric light, 5; garbage, 10; mayor, 1; parks, 2; police, 7; probation office, 4; road, 21; treasurer, 1; water and sewer, 12; municipal market, 3. The 50 new cars purchased in the last two years are as follows: Fords, 15; Packards, 7; Moreland, 6; Federal, 4; Chevrolet and Buick, 3 each; Denby, Studebaker and Dodge, 2 each; Cadillac, Mack, Klieber, Doane, Elgin and Essex, 1 each



ACME ROAD ROLLERS AT WORK REPAIRING AVENIDA PONCE DE LEON, SANTURCE, PORTO RICO



The Public Demands Action

* * *

In progressive cities throughout the Eastern and Northern states, Chambers of Commerce and other public bodies are much concerned in the program of snow removal, as they realize what losses can be caused by snow blockades even if only for a few days. How successfully and economically "Caterpillar"* methods combat snowfall is proved by the following statements.

" . . . You might be interested in knowing over 36 inches of snow fell here during January (1923) and with your tractors we believe we have the best streets of any city of our size in United States where this amount or less snow has fallen this winter."—Gloversville, N. Y., Chamber of Commerce.

"The work (snow removal) could not be done satisfactorily without the "Caterpillar" Tractor."—Town of Brookline, Mass.

"With our 10-ton Holt we are able to promptly take care of snow that previously would have kept us laboring for days."—Wm. McClellan, Supervisor, Town of Woodbury, N. Y.

" . . . In addition to the entire satisfaction of the "Caterpillar" we express our appreciation of the valuable service rendered by your organization."—R. M. Wilcomb, Municipal Manager, Springfield, Vermont.

* * *

Wherever snowfall imperils health, city traffic, or interurban transportation, "Caterpillars" afford a certain, inexpensive method of snow removal. The same machines, in summer, provide the most efficient means of road or street building and maintenance. Your community deserves "Caterpillar" service. Write today for proof of the "Caterpillar's" ability to serve and save.

**There is but one "Caterpillar"—Holt builds it*

THE HOLT MANUFACTURING COMPANY, Inc.

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Eastern Division: 250 W. 54th Street, New York

Branches and service stations all over the world

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HOLT
PEORIA, ILL.
STOCKTON, CALIF.

Chicago, Ill.

Minneapolis, Minn.

Indianapolis, Ind.

Canadian Holt Company,
Ltd., Montreal

Over-Insurance a Factor in Fire Losses

IN the opinion of John G. Gamber, State Fire Marshal of Illinois, who delivered an address on the subject at the recent annual convention of the International Association of Fire Engineers, the fire losses of the United States will not be materially reduced unless there is a revision of underwriting practices. In addition to citing several cases of arson perpetrated to collect excessive insurance, Mr. Gamber said in part:

The public will demand before long that the insurance companies cease to make incendiary fires attractive. One of the insurance companies, with a little more courage than the rest, published an interesting chart recently. I refer to the now famous Glens Falls chart. One line showed the ups and downs of business failures since 1910. The other line showed the fire loss ratio for the same period. It showed conclusively that fire losses increased exactly as business failures increased and vice versa. It led to a declaration by the company that "honest policyholders are supporting criminals with every premium they pay; that incendiarism increases when business failures increase."

Commenting on this chart, the National City Bank of New York in its Bulletin said:

"This showing is startling, for it reveals the shameful fact that incendiarism is an enormous factor in the fire losses of this country. It presents a disgraceful record of fraud and waste in American business life."

A few years ago burning for profit was largely the crime of professional firebugs or rings of firebugs. Every so often the authorities would break up a ring and put the leaders in prison, and arson would be stopped until the crooks managed to get out on parole or served their time. During the last few years,

however, burning has been by no means confined to professional crooks, although the professional arsonist has no doubt thrived and multiplied during these months of lucrative opportunity. There has grown up a group of "fire-making opportunists" in every walk of life, who have learned that there is a profit in burning out, if enough insurance can be secured.

Give a man too much insurance and one of two things is likely to happen. If he is dishonest, he is likely to plan a fire when it suits him. If he is not dishonest, he is likely to let the hazards accumulate, feeling that he will be repaid generously in case of fire and that there is no object for him to go to the trouble of keeping things up. In time the expected fire often occurs.

We are a long way from the original idea of insurance, which was a banding together of property owners to protect from ruin in case of fire. It was never intended to relieve the individual from all responsibility for his carelessness or to yield him a profit. But as long as agents continue to write all a property will stand, or more, they will put a premium on carelessness. As long as over-insurance can

be so easily secured, arson will flourish and the incentive to burn will be given to the dishonestly inclined.

One of the sensations incident to Fire Prevention Week was the refusal of Governor Hyde of Missouri to issue a proclamation. In so doing, he said: "Campaigns of education on fire prevention only scratch the surface. The fault is primarily with the companies and the laws, and not the people." He charged that fire waste is due to over-insurance and that over-insurance is due to the greed of the companies for premiums.

Case after case comes into the office for investigation, referred to us by the companies because they found too much insurance when they went to adjust them. Time after time

State Fire Marshals Ask Aid of Insurance Companies

At the 1923 convention of the Fire Marshals' Association of North America a resolution was adopted calling upon the insurance companies and their agents to wipe out over-insurance. This resolution was as follows:

"WHEREAS, the representatives of the National Board at this meeting confirm our own conclusion that arson was more prevalent in 1922 than ever before in the history of this country; and

"WHEREAS, the primary cause of arson is over-insurance,

"THEREFORE, we, the members of the Fire Marshals' Association of North America, in convention assembled, do condemn this practise and recommend that all possible steps be taken to prevent it.

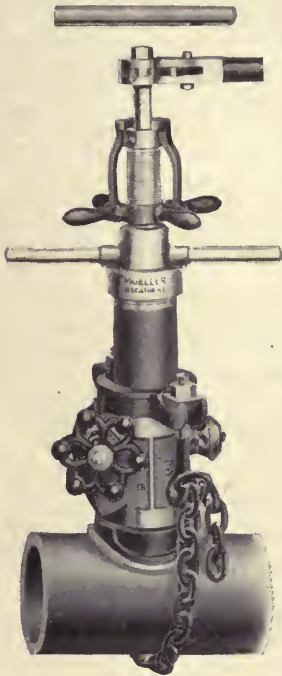
"We further believe that it is within the power of the insurance companies, through their agents, to largely control, if not completely wipe out, this vicious practise.

"And we most respectfully urge that the insurance companies use more care in the selection of agents and make such arrangements with their agents as are necessary to correct this great evil in the insurance business.

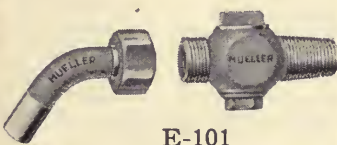
"We would further recommend that the following clause be added to all fire insurance policies:

"Additional insurance not permitted without the written consent of the agent of this company."

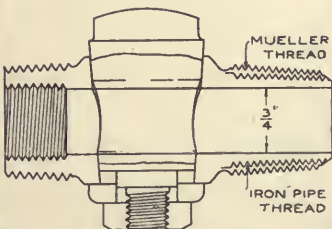
"AND BE IT RESOLVED, that the secretary furnish each insurance commissioner and fire marshal with a copy of these resolutions, that each member of this association send, and that each insurance commissioner and fire marshal not a member of this association be asked to send, copy of this resolution to every company licensed in his state, with the request that it receive most earnest and careful consideration."



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we go into court and are beaten by the jury because the average jury will not convict when it is shown that a company sold a man too much insurance and accepted his premium. It is doubly discouraging when an agent or appraiser, in order to save his face, testifies for the defense by upholding his excessive valuation of the property.

It certainly does not reduce the fire loss when company adjusters make so-called "liberal adjustments"—another term for paying the assured a profit in order to retain his favor and patronage. And it is worse when public adjusters are permitted to put over settlements far in excess of values.

Perhaps these things strike you [fire chiefs] and me differently from the way they do the insurance companies. Every time you are called out to fight a fire it may be that you or some of your men will be killed or injured. Firemen always take that chance. Yours is a most heroic calling, because you fight to save life and property from fire, one of the most terrible agents of destruction. The person who willfully sets a fire is about as despicable as a person can be and he is not only your enemy, but your potential murderer as well. A crooked insurance agent who aids this sort of criminal belongs in the same class. A careless or greedy agent, who thinks only of his premium in writing a lot of insurance, cannot entirely escape the responsibility, for he provides the incentive for the crook. You are entitled to expect the cooperation of the insur-

ance companies in wiping out this sort of thing so far as possible.

I do not believe in destructive criticism of the insurance companies. The insurance business is one of the greatest and most important in the country. It underlies our entire business and social fabric. I look upon insurance much as I look upon a bank. The companies are custodians or trustees for enormous amounts of the people's money. We all chip in, so to speak, so that in case any of us suffer a fire we will not be ruined. Any one who cheats on his insurance is cheating all of us.

The money we place with the insurance companies is a trust fund, and every part of the business should be conducted so that there will be as little cheating or fraud as possible. A bank will not make a small loan without entirely satisfying itself as to the security. It would seem that an insurance company, carrying millions at risk, should require at least reasonable scrutiny by the agent as to the moral character and assets of the insurance purchaser. We are entitled to the most careful practices and management and we are entitled to have every precaution taken against possibility of losses, in order that we may benefit from a real reduction of losses by a reduction in insurance rates.

The public is becoming considerably more enlightened as to fire losses through the fire prevention campaigns. Honest and careful citizens will some day become tired of carrying the load for the dishonest and careless.

Americanization--the Broad View

IT is commonly accepted to-day, in theory at least, that Americanization is something that has to do not with immigrants alone. It may be defined as the business of making good American citizens of every one that inhabits American soil—the native-born and the immigrant, the adult and the child in school. No longer do we assume that a man is truly American, in attitude and in action, merely because he happens to have been born within our country's confines. The conviction has been brought home, rather, that it is in large measure the un-American attitude of the native-born that has made the Americanization of the immigrant so difficult. And we are pretty certain now that, if the so-called American portion of our communities would but realize its obligation to live the creed of which it boasts, the immigrant problem would be solved with unconscionable ease. This is platitudinous, but tremendously important.

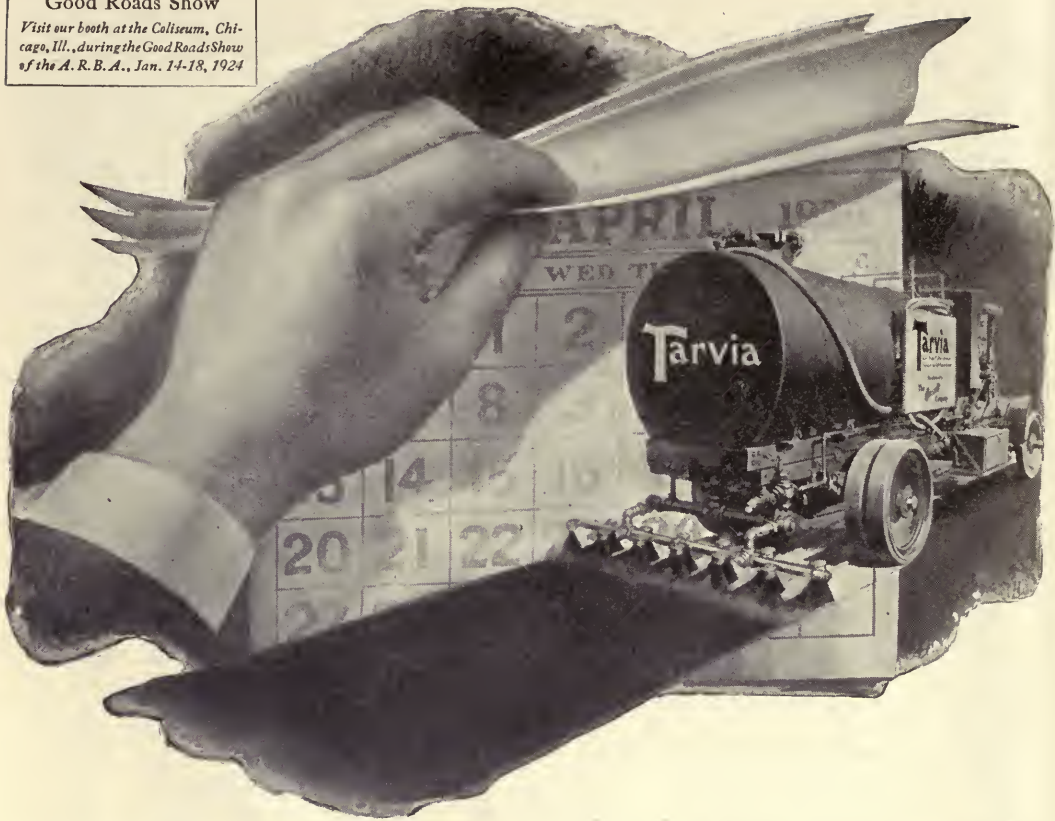
Note that this throws the obligation of solving the immigrant problem on the community as a whole, not on any one or two agencies in the community. For years the burden of this work fell mainly on the school, and on private agencies which regarded the teaching of the immigrant as a very important task. It was assumed seemingly that, if we could teach the immigrant the English language, and bring him

thereby to a knowledge of America the beautiful, his Americanization was assured; and this despite the fact that he actually encountered America the unlovely at every turn. Obviously, this spells futility. The schools have a part to play in the Americanization process, to be sure—a part of the utmost importance. Theirs is the task of removing the language barrier. This is often styled the first step in Americanization. To this task the schools should primarily address themselves. And that they are doing to-day with considerable success. But if the immigrant problem is really a community problem, the schools can do comparatively little, working alone, unaided, and oftentimes without the interest and support of the community as a whole. It must be recognized that Americanization is a matter of schooling, in truth. It is also, however, a matter of prevention of exploitation, of good housing, of satisfactory industrial conditions, of neighborliness, and so on. Everything that touches the immigrant's life is an instrumentality for his Americanization, or the reverse. Hence the need for the entire community to take a hand in this work of assimilating the thousands that yearly throng to us from overseas.

—From "Americanization in the United States," by John J. Mahoney. Professor of Education, Boston University, in *Bulletin*, 1923, No. 31, of the U. S. Bureau of Education.

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City Officials and Contempt of Court

THE much-discussed Craig contempt case adds nothing to the law of a municipal officer's liability to punishment for contempt of court.

Charles L. Craig, Comptroller of the City of New York, criticized the position adopted by Federal Judge Mayer in receivership proceedings for the Brooklyn Rapid Transit Company. He was adjudged to be guilty of contempt of court and sentenced to jail for sixty days. The United States Supreme Court ruled that a habeas corpus proceeding was not a proper method of bringing the merits of the conviction up for review; that proceedings in the nature of an appeal should have been taken. The matter being drawn to the attention of the President, he, "in consideration of the premises, divers good and sufficient reasons . . . thereunto moving," remitted the imprisonment.

At the moment, the principals to the controversy appear to attach importance to a distinction in legal forms, in that although Mr. Craig is relieved from serving the sentence pronounced by Judge Mayer, the Judge is quoted in the daily press as taking satisfaction from the circumstance that the Comptroller was not *pardoned*, while the latter finds complete vindication. The Attorney General of the United States recognized the distinction on which Judge Mayer relies, by emphatically recommending against a pardon but advocating a remission of the punishment.

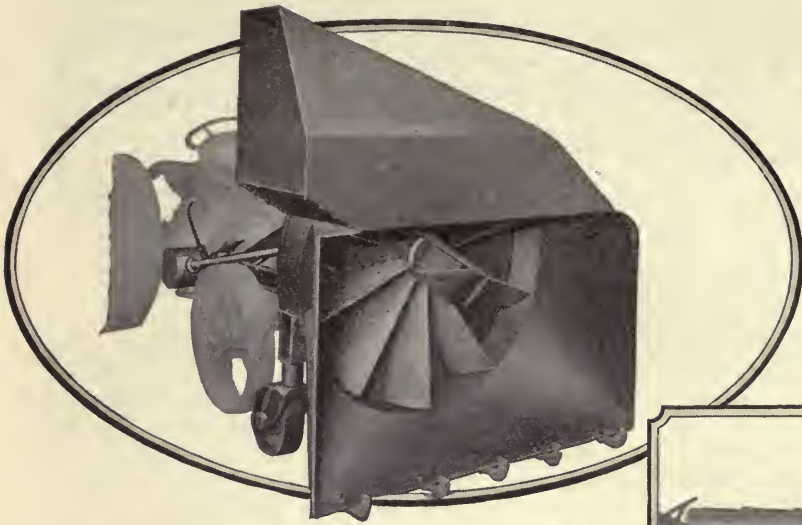
Although the Attorney General's recommendation that the punishment be remitted takes into account Mr. Craig's official position, it will be difficult, if not impossible, to find a judicial precedent or rule of law which renders a municipal officer any more immune for an actual contempt of court than any one else in criticizing the course of a judge in litigation. In several cases (see 13 Corpus Juris, 40) it has been held

that the doctrine that a corporation may be guilty of contempt of court applies to municipal corporations. In a Louisiana case (43 Southern Reporter, 455), the Supreme Court of that state failed to find reason for exempting a district attorney from punishment for contempt of court.

Because the higher courts did not pass upon the question whether or not Mr. Craig was actually guilty of a contempt of court, this case cannot serve as a precedent concerning the right of municipal officials to criticize the action of judges. But it seems to the writer of this article that the bounds of right in this regard are fairly indicated by the following language once used by the Arkansas Supreme Court (16 Arkansas Reports, 384):

"Any citizen has the right to publish the proceedings and decisions of this court, and if he deem it necessary for the public good, to comment upon them freely, discuss their correctness, the fitness or unfitness of the judges for their stations, and the fidelity with which they perform the important public trusts reposed in them, but he has no right to attempt, by *defamatory* publications, to degrade the tribunal, destroy public confidence in it, and dispose the community to disregard and set at naught its orders, judgments, and decrees. Such publications are an abuse of the liberty of the press, and tend to sap the very foundation of good order and well-being in society, by obstructing the course of justice. If a judge is really corrupt, and unworthy of the station which he holds, the constitution has provided an ample remedy by impeachment or address, where he can meet his accuser face to face, and his conduct may undergo a full investigation."

In another leading case (State vs. Bee Publishing Co., 83 Northwestern Reporter, 204), the Nebraska Supreme Court decided that it was contempt of court deliberately to seek to influence judicial action by the publication of articles threatening judges with public odium and reprobation should they decide pending litigation in a particular way.



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And remember—Patrol turns the trick where heavy, cumbersome plows would stall or tip. Goes through drifts that would need triple teams of horses to drag a wedge. Guaranteed—and sold through Fordson dealers only.

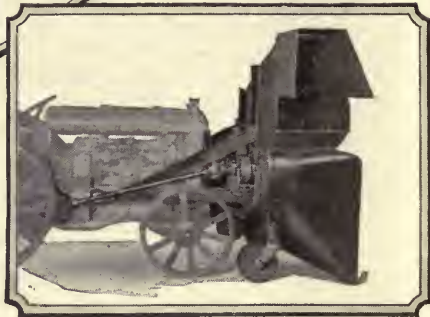
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Sundry Items of Municipal Law

Ordinance Providing for Licensing and Bonding of Furniture Movers Upheld

An ordinance of the city of St. Louis, providing for the licensing and bonding of movers of household goods, office furniture, store fixtures, etc., was upheld by the St. Louis Court of Appeals in the case of *Mike Berniger Moving Co. vs. O'Brien*, 240 Southwestern Reporter, 481.

Among other provisions, the ordinance requires payment of an annual fee of \$5 for each van used, and the filing of a bond for faithful performance of the licensee's duties as public mover, including the indemnifying for injuries to moved property due to causes for which the mover is responsible. These clauses are held to be reasonable, and the whole ordinance is declared to be authorized by the city's charter power "to license and regulate all persons, firms, corporations, companies and associations engaged in any business, occupation, calling, profession or trade."

Special Assessments for Park Purposes Approved

Applying the provision of the Minnesota constitution which authorizes the levy by cities of special assessments for local improvements, the Minnesota Supreme Court says in the matter of the Improvement of Lake of the Isles Park, 188 Northwestern Reporter, 54:

"It is now too firmly settled to admit of dispute that acquiring land for a public park, fitting it for open air recreation, and adding to its appearance by planting trees, shrubbery, and flowers, are all local improvements of special benefit to private property in the neighborhood."

Individual's Service May Become a Public Utility

In a proceeding lately before the Public Utility Board in Newark, N. J., it appeared that an owner of a tract of land had sold off plots for the erection of dwelling houses, and on an understanding that water service would be supplied from private mains on the premises. Service being refused to the owner of one plot, on the ground that she had violated building restrictions, she invoked the aid of the Public Utility Board on the theory that the Board was empowered to regulate the water service furnished by the owner of the system, the same as in the case of regular water companies.

Platted Areas Adjacent to Municipality Held Not Assessable for Municipal Improvements

For want of statutory authority to assess land outside the limits of a town for a sewer improvement constructed by the municipality, it was decided by the Iowa Supreme Court in the case of *Turner vs. Cobb*, 192 Northwest-

ern Reporter, 846, that no such assessment could be levied. The Court said:

"That a municipality has no extraterritorial jurisdiction to levy taxes unless specially authorized by statute is well established."

Incidentally, it was held that a statute providing for the making of a plat by an owner who subdivides land "for the purpose of laying out any town or city, or addition thereto," etc., could not be interpreted as permitting a private landowner to create an incorporated town or city, or an addition thereto. The Court observed that "It requires proceedings on the part of the inhabitants of a city or town, as provided by statute, to legally incorporate the same as a legal municipality, even though the owner of a tract of land could 'lay out' the same as a city or town."

War Tax Collectible on Municipal Purchases

A decision announced by Mr. Justice Whitaker of the New York Supreme Court in the case of *Packard Motor Car Company vs. City of New York*, is adverse to the right of cities to exemption from payment of war tax on automotive equipment purchased. The ruling accords with an opinion of the Attorney General of the United States and is at variance with rulings of the Treasury Department that "articles sold to a state or political subdivision thereof by the manufacturer for use in carrying on its government operations are not subject to the tax," and that "articles sold by the manufacturer to a state, county or municipal institution are also exempt from tax when paid for entirely out of public money."

Right to Remove Obstructions in Streets Recognized

A decision of the County Court in Pittsburgh, although not handed down by a tribunal whose decisions are legally binding as precedents on other courts, accords with a conception of common sense. A motorist left his car in a street in such position that it obstructed passage of street cars; the automobile having run out of gasoline. A street car inspector, in attempting to push the automobile across the street and out of the way, caused the clutch to be thrown in and the engine started, and the car ran down the street, causing considerable damage. The local traffic judge convicted the inspector of having violated the state automobile law by interfering with another's motor vehicle. But, on appeal, the conviction was reversed; the County Court holding that the inspector had exercised a right common to all citizens, to remove obstructions to the passage of public conveyances and the proper use of public highways.

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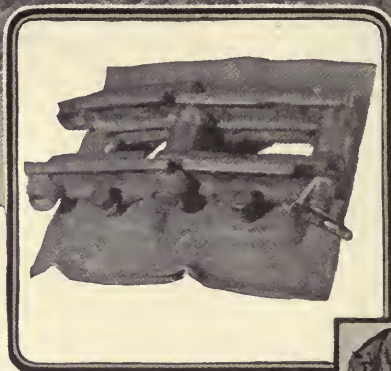
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Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of

THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Zoning Ordinances Not Previously Listed

WOONSOCKET, R. I.—Adopted a zoning ordinance December 10, 1923.

NEW JERSEY.—The following ordinances not listed in the summary of the Department of Commerce, Washington, D. C., described in our December issue, and not given heretofore in these "Notes," are listed in the report on Zoning in New Jersey of the New Jersey State League of Municipalities referred to below:

Belleville, Bogota, Bradley Beach, Fanwood, Franklin Township, Hawthorne, Leonia, Linden, New Brunswick, Ridgefield Park, Sea Girt, Totowa, Merchantville.

Recent Zoning Decisions

CALIFORNIA.—Motor Home Inc. v. Hedden, Building Inspector of City of Long Beach, Superior Court, Los Angeles County, November 14, 1923.

Mandamus to compel issuance of permit for a building to be used for the storage of more than five automobiles, and stores, in a district in which the zoning ordinance provides that no building or premises shall be used for a "garage for more than five motor vehicles." The site in question is now partly occupied by a one-story public garage, and there are other public garages in the vicinity; also dwellings, and appurtenant private garages. The ordinance provides that a building or premises used for a non-conforming use shall not be enlarged or structurally changed unless the use is changed to a conforming use.

The inspector refused to issue the permit, on the ground that the ordinance prohibited the use in the district. The petitioner was frankly advised by the inspector before the application was filed that the application would be denied because the use was forbidden in the district. He therefore did not file plans or specifications, and no objection to the application was made on that ground.

Held that the duty to issue the permit did not come into existence until all the requirements of the Building Code were complied with, and the filing of the plans and specifications was necessary to create the duty.

Held, also (following *Ex parte Hadacheck*, 165 Cal. 416 on this point), that, as the question of reasonableness of the ordinance was certainly one in which reasonable minds may differ, it must be held by the Court to be valid. The court will not substitute, in such a case, its judgment for that of the Legislature.

Held, also, that the provision allowing the

continuance of non-conforming uses did not make the ordinance discriminatory, unequal in operation, tend to create a monopoly, and in consequence unreasonable and void.

Held, also, that the incorporation by reference of the zoning maps did not make the ordinance void under Art. IV, Sec. 24 of the state constitution requiring all the laws, etc., of the state to be in the English language.

MISSOURI.—The long-pending cases in which certain use provisions of the St. Louis zoning ordinance were attacked as invalid (*State ex rel. Penrose Inv. Co. v. McKelvey*; *State ex rel. Better Homes, etc., Co. v. McKelvey*; *City of St. Louis v. Evraiff*) have now all been decided, definitely and finally, against their validity, the petitions to the Supreme Court of the State (*En Banc*) for a rehearing of these cases having all been denied.

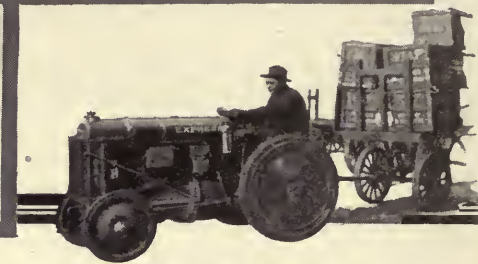
NEW YORK.—*Cohen v. Rosevale Realty Co. Inc.*, 121 Miscellaneous Reports 618.

The premises in question were subject to a private restrictive covenant, which expired January 1, 1923. On August 8, 1922, the defendant obtained a permit to construct a building on the premises, violating the covenant. On December 22, 1922, the city adopted an amendment to the zoning regulation which prohibited the erection of the building in accordance with the plans on file. Since January 1, 1923, the defendant has undertaken the erection of the buildings as originally contemplated, claiming to be justified because the provision of the resolution allowing the completion of buildings, as planned, existed at the time of the passage of the resolution.

Held that he could be enjoined from so doing, at the suit of an individual specially damaged thereby. Buildings erected in violation of a restrictive covenant are illegally in existence, and the provision of the resolution relied upon by the defendant applies only to buildings legally existing at the time of the passage of the zoning resolution or amendments thereto. The defendant having built in violation of law, cannot benefit by such illegal conduct.

People ex rel. Parry v. Board of Appeals of the City of New York, 121 Miscellaneous Reports 631.

Where a petition for a writ of certiorari fully recites in what respects it is claimed that the action of the Board of Appeals in denying relator's petition to erect a public garage in a business district is erroneous, a return to the writ which states as a reason for denying re-



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lator's application that it was "for the best interests of the community," and to prevent "the desecration of the community" wholly fails to satisfy the requirements of the statute that such a return "must concisely set forth such other facts as may be pertinent and material and to show the grounds of the decision."

It not appearing that the Board determined the only question before it,—to-wit: whether or not there were practical difficulties or unnecessary hardships in carrying out the strict letter of the law,—the decision of the Board, on whatever ground made, was illegal and the

matter was before the Court on its merits.

Upon a finding that the decision of the Board was contrary to the weight of evidence, the writ of certiorari was sustained, said determination of the Board reversed, and the permit applied for directed to be issued.

The New Jersey State League of Municipalities, Bureau of Municipal Information, 606 American Mechanic Building, Trenton, N. J., has recently issued a fifteen-page mimeographed report (No. 112) on "Zoning in New Jersey." Applications for this report should be made to Sedley H. Phinney, Executive Secretary.

The Municipal Bond Situation

A Seven-Year Comparison

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

THE total amount of state and municipal bonds issued in 1923, omitting notes maturing in less than one year, is estimated by the writer at \$1,075,000,000. This figure is based on reports, mostly official, collected from about 7,000 states, counties, cities, towns and districts in the United States and its possessions.

State and local borrowing in 1923 declined over 15 per cent, as compared with the year 1922, and over 22 per cent, as compared with 1921. The yearly totals since 1917, the last "normal" year, are given.

As these figures clearly show, state and municipal borrowing has increased tremendously in recent years. During the same period, Federal income surtaxes, from which bonds of states and municipalities are exempt, have been levied at very high rates. Naturally, those persons subject to high surtaxes have invested heavily in the exempt bonds, thus creating an abnormal demand for them. It has been assumed, by many of the most prominent students of and writers on the subject of taxation, that the increased demand for exempt bonds has resulted in wide-spread municipal extravagance, and the increase in local government borrowing since 1917 is cited in support of this argument.

However, a few moments' serious consideration of the matter should result in a different conclusion.

The fact is that in 1917 and earlier years the average size of all state and municipal loans was about \$89,000. By 1923, the average size of these loans had jumped to over \$150,000. In other words, the cost of a schoolhouse, bridge,

road, court house or sewer system considerably more than doubled between 1917 and 1923. Any one who has bought a home or built a garage or called in the painter to redecorate a room knows that to be a fact. This is the explanation of the biggest part of the increase in public borrowing.

But it is not the whole story. Since 1917, says Secretary Mellon, the population of the country has increased 13,000,000. Such growth necessarily means tremendous new outlays by states, counties, cities, etc., for necessary public works. Further, there has been a proper and important growth in the good roads movement, fostered

largely by the Federal Government, but financed with state, county and district bonds. And the Soldiers' Bonus, a direct outgrowth of the war, has already resulted in the issuance of \$275,000,000 of state bonds.

Municipalities may have been extravagant, but only in the sense and to the extent that individuals have been spending money freely in the recent years of war-time inflation.

Consideration of the facts does not support the conclusion so frequently reached by careless speakers and writers that municipalities have been borrowing far beyond their requirements merely because they have been in a position to borrow at relatively low interest rates.

EDITORIAL NOTE.—A report just released by the Bureau of the Census, states that the total outstanding net indebtedness in 1922 of the 261 cities having a population of over 30,000 amounted to \$3,618,967,272, or a per capita of \$93.42. For the 199 cities included in the 1922, 1918 and 1915 reports, the per capita debt was \$95.61 for 1922, \$79.51 for 1918, and \$76.22 for 1915.

Yearly Totals of State and Local Borrowings

1917.....	\$444,932,848
1918*.....	262,818,844
1919.....	770,195,248
1920.....	773,663,986
1921.....	1,383,368,900
1922.....	1,279,553,134
1923.....	1,075,000,000

* Decline due to Capital Issues Committee's restrictions on all forms of security flotations.



HUBER ROADTOOLS MAINTAINERS - ROLLERS

The Huber Road Rollers

THE Huber Four Cylinder Gasoline Road Roller combines a modern internal combustion engine with modern power transmission. It starts easy and keeps going. It has a low center of gravity, surplus power, convenient control, and economy of operation. The air controlled scarifier folds up neatly underneath the deck when not in use.

Huber Steam Road Rollers with return flue boilers have been standard equipment with road builders for generations. There are none better.

A One Man Maintainer

THE Huber Self Contained, Power Lift Maintainer is a one man tool. The long flexible blade reclaims material from outside the track, without destroying the berm or altering the crown. It is most satisfactory for spreading dumps or shaping subgrade.

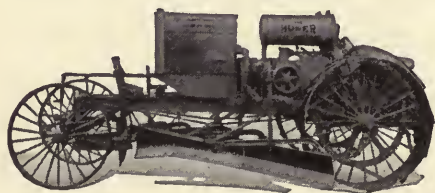
This self contained, power Maintainer has

weight enough to keep the blade down when making a heavy cut and is powerful enough to pull a detached grader when necessary to cut deep ditches. The heavy duty, four cylinder engine furnishes excess power.

The Huber Maintainer is economical, fast and dependable. It is equipped with an efficient pressure scarifier.

Write for illustrated circulars on any Huber Road Tool.

THE HUBER MFG. CO., 102 Center St., Marion, Ohio



***Huber Exhibit at Chicago
Road Show, Space G-20
Greer Building***

Hints, Helps and Happenings

Mortality Rates for 1922

THE mortality rate for the registration area of the United States as shown by compilations released by the Bureau of the Census last month, averaged 11.8 per 1,000 population for the year 1922, as against 11.6 in 1921 and 13.1 in 1920. For tuberculosis the death-rate per 100,000 was 97.0 in 1922, 99.4 in 1921, and 114.2 in 1920. For cancer the figures per 100,000 were 86.8 in 1922, 86.0 in 1921 and 83.4 in 1920.

Death-Rate from Automobile Accidents Higher Than Ever

FIGURES made public by the Census Bureau on December 2 show that the death-rate from automobile accidents for the United States continues to grow both in total and in percentage of population. Fatalities for 1922 totaled 11,666 in the census registration area of the United States, which contains about 85 per cent of the total population. This is an increase of 1,498 over the preceding year.

Per hundred thousand of population in the registration area the death-rates from automobile accidents for the last four years have been: 12.5 in 1922; 11.5 in 1921; 10.4 in 1920, and 9.4 in 1919.

California has the highest rate of the 37 states in the registration area, its total representing 26.0 per 100,000 population. New York has the second highest rate with 16.7. New Jersey was third with 16.4, and Colorado fourth with 16.3. No other state's rate exceeded 16.0 per 100,000. Mississippi had the lowest rate with 3.4 per 100,000.

The largest increase was shown in Vermont, with 11.1 per 100,000, or 4.6 over 1921. Decreases were recorded in Connecticut, Massachusetts, Montana, Virginia and Washington, with Washington showing the largest reduction—from 14.5 to 12.3, or 2.2 per 100,000.

Morals and the Housing Shortage

A RECENT report by Judge Edward F. Boyle of the Children's Court of the City of New York, to State Industrial Commissioner Bernard L. Shientag, adds forcible testimony to the relation between juvenile delinquency and the present housing shortage. Citing the conditions in twenty typical cases, Judge Boyle shows that the inability of parents to obtain proper homes has forced them to keep their children in unwholesome environments. The moral conditions described in the report, while referring particularly to New York City, may well serve as a warning to many other communities where shortage of houses and high rents are no doubt producing similar evils. To quote the concluding paragraphs:

"Families are 'doubled up' in small apartments to an extent which was never before experienced in this city. Some of the results of this practise are too shocking to describe. The inevitable result in general is a serious lowering of moral standards.

"Girls more and more, and in proportion as the home space is preempted because of the existing congestion in housing, are substituting hallways for the old-fashioned parlor or living room in which to find place for the entertainment of their companions—male and female.

"In greater numbers than ever, there will be found in the small apartments of the poor, the male lodger or lodgers (always a menace). As a rule, the best room in the home is his, while the family itself is relegated to the meager quarters remaining—too often only a kitchen, but usually a bedroom or two, invariably overcrowded. It is not rare to find instances where boys and girls as old as fourteen, fifteen and sixteen years are found sleeping in the same room together—as many as six in a small bedroom and at times children of opposite sexes as old as fifteen and sixteen, in the same bed. One cannot in decency specify here some of the results of this kind of living, if it may be described as such. It is enough to state that the conditions found to exist, the intermingling both night and day of males and females, young and old in overcrowded quarters, are responsible for many cases that pass through the Children's Court, a description of some of which would sound the very depths of moral depravity."

Neighborhood Music Contests Precede City-wide Music Week

THERE have been many movements to foster the development of community music, because music is known to be the finest medium in the world for bringing together people of all races, all types, and all classes on a ground of common understanding. But a project for the development of public taste and appreciation for good music greater in scope and seriousness of purpose than any heretofore undertaken in the United States is the year-round program of music contests now being carried on in New York City under the auspices of the New York Music Week Association.

The plan is twofold: it includes, first, a series of contests in which all who are not professional musicians may take part; and, second, the participation of thirty or more of New York's foreign-born groups not only in the contests but also in the Inter-racial Festival that is to be a feature of the annual Music Week in May.

Elimination contests for soloists in voice, piano, wind and string instruments, and for



On with the Traffic!

Away with Snow!

"We clear the streets for traffic, always," says the head of a Board of Public Works. "We have never called upon the merchants to help out this department in snow removal."



This new book "The Open Road" is yours for the asking. It's an interesting story on the "why" and "how" of snow removal.

Municipalities owning Best Tractors, "Sixties" or "Thirties," use them the year 'round. They replace animals for road work, grading, heavy hauling, etc., in Summer as well as on snow removal work in Winter.

C. L. BEST TRACTOR CO.
SAN LEANDRO, CALIFORNIA

Sales Branches

127 Montgomery St.
San Francisco, Calif.

Distributing Warehouse
820 North Second Street
St. Louis, Mo.

30 Church Street,
New York City.

7-124

BEST TRACTORS

orchestras, church choirs, and choral societies in various types of competition, have been organized in each of the forty-eight school districts of New York. District winners are eligible for a larger borough contest in each of the five boroughs which constitute Greater New York; finally, borough winners compete in the culminating event of the series, the inter-borough or city-wide contest in Music Week.

Contests are held at a public school auditorium or at some central place in the district

where parents and friends of the contestants may conveniently gather. The people of the community listen to the same test pieces of good music played hour after hour and hear the constructive criticisms of the judges. They as well as the contestants themselves are learning to discriminate — the first step in the development of taste. This, from the point of view of the Association, is one of the most important phases of the contest work.

A unique feature of the New York Music Week Association program is that groups or individuals compete not one against another to see which is the better, but all against a certain high standard set by the Association. Only those in the district contests whom the judges think are entitled to a grade of seventy-five per cent may qualify for the borough contest. Medals and shields are awarded contestants who attain the standards set.

While the New York Music Week Association realizes that other cities can hardly conduct music contests on so large a scale, it is believed that the Syllabus of the Contest Committee will be of interest to other communities in planning educational programs in music on a city-wide basis. A copy of the Syllabus and information regarding the plans for the 1924 Inter-racial Festival will be sent to any reader of THE AMERICAN CITY on application to the Association, at 29 Madison Avenue, New York,

How Cities Can Reduce the Cost of Elections

THAT every city in the state of New York, with possibly one exception, can reduce its cost of elections in one or more ways is the conclusion of the New York State Bureau of Municipal Information, with headquarters at Albany. A detailed report (No. 943), based on data supplied by the city clerks throughout the state, has been issued by the

Bureau in mimeographed form.

The average payments from city treasuries (except New York City) in 1922 for elections, including primary and registration, are shown to have been 71 cents per capita. To reduce this cost, the Bureau makes the following recommendations:

1. Increase the size of each election district as much as the law permits. A redistricting study should be started now, so that the work may be completed in time for official action before July 1, which is the last day the law allows for consolidation, division or alteration of election districts, except New York City.
2. Reduce high salaries of election officials to a reasonable minimum.
3. Let contracts for printing ballots, ballot labels for voting machines and election supplies on a competitive basis, and keep an accurate record of

and check on all election supplies.

4. Use schools, fire houses, libraries and other public buildings for registration and polling places.
5. Substitute voting machines for paper ballots.
6. Use two machines in an election district where possible.
7. Elect municipal officers at general election in odd numbered years and abolish spring municipal elections.

Good Citizens' Pledges for 1924

The following New Year's Resolutions, published early in 1923 in chamber of commerce bulletins, offer suggestions that may be found helpful by other organizations in drafting Good Citizens' Pledges for 1924:

From the Members' Bulletin of the Chamber of Commerce of Phoenix, Ariz.:

I cannot afford to be a beneficiary in permitting others to carry my civic responsibility. Therefore—

I resolve that during the coming year, through the Chamber of Commerce, I will devote all the time and effort I can to the work of promoting the business and civic prosperity of Phoenix.

From "Community Progress" official bulletin of the Chamber of Commerce of Little Falls, N. Y.:

In the year just beginning we will double our efforts for the welfare of the city.

We will not be content with little achievements that please little minds.

We will strive to enlarge our vision.

We will labor wholeheartedly with all who are ready to work with us.

We will not seek to detect in them mean motives, but will credit them with motives as high as our own.

We will not be faint-hearted, for we shall win out, because in our labor we shall think not of ourselves, but of our city.

Thus to-day, on the threshold of a new era, while cowards peer doubtfully into the future, we will take heart and not be content to wait for better times, but proceed to make them.



Garford Equipment Ranks High in Favor in Well-Administered Municipalities

City officials, department heads and municipal engineers know by experience that in selecting motor equipment they are assured of expert counsel and valuable co-operation if they call on Garford Engineers.

In many American cities, notable for up-to-date methods and well-run departments of safety, health and sanitation, Garfords have been chosen for their dependability, their economical operation and their slower depreciation.

Garford Engineers have made particular study of municipal motor equipments and can furnish much practical and worth-while information.

A postal card will bring you some interesting facts about truck transportation and recent developments. Send for it.

The Garford Motor Truck Company, Lima, O.

Manufacturers of Motor Trucks 1 to 7½ Tons

GARFORD

DEPENDABLE TRANSPORTATION

High Schools Unite in Pageant of Famous Debates and Speeches

AN exceptionally interesting program is being arranged for the tenth annual meeting, to be held January 5, in New Brunswick, N. J., of the Interscholastic Debating Conference, a league which now embraces more than a hundred New Jersey schools and fourteen schools in New York State. The exercises will be in the form of a pageant of famous debates and speeches in the nation's history. Two of the schools, for example, will present the John Marshall-Patrick Henry debate, and two others will engage in the Webster-Haynes debate. Among the speeches to be given, not in debate form, are Roosevelt's first inaugural address, Cleveland's message of acceptance of the Presidential nomination, and Wilson's Mount Vernon speech. For the Revolutionary and Civil War periods the young orators will wear appropriate costumes.

Municipal Departments Cooperate with Safety Council in St. Louis Safety Week

TO arouse public sentiment to a realization of the present highway accident situation, the St. Louis Safety Council conducted a Safety Week, November 18-24, 1923, in which the support given by the various municipal departments was exceptionally effective.

Through the cooperation of the Department of Streets and Sewers, white lines were painted at street intersections in the congested districts, and the words "Watch Your Step" were painted on the sidewalks at these intersections. This Department also turned over to the Safety Council, for the purpose of holding demonstrations during the campaign, one entire block on Twelfth Boulevard, the widest and most prominent street in the city. No parking of cars was allowed on this block during the week, and all traffic was directed away from it while the demonstrations were being made.

Exhibits showing the extent to which safety education is being carried on by the public schools were displayed in all the schools in the city, and each building was open to the public on one evening during the week. Four-page pamphlets on home safety were published and 100,000 of these were distributed among the school children.

Early in the campaign the monument shown in the accompanying illustration was erected on one of the principal streets of the city, and dedicated to the memory of the thirty-two children who had lost their lives in highway accidents in St. Louis so far in 1923. During the impressive dedication ceremonies, a large dirigible balloon cruised over the scene and dropped flowers and pieces of safety literature. At the conclusion of the ceremonies, the Jefferson Barracks band played a funeral dirge, while six boys and girls walked around the monument scattering flowers in memory of the children who had been killed.

The Fire Department of the city cooperated in the work by giving a demonstration of life-



MONUMENT DEDICATED TO THE MEMORY OF CHILDREN KILLED IN HIGHWAY ACCIDENTS IN ST. LOUIS IN 1923

saving methods on one day during Safety Week. Members of the Department erected a temporary four-story structure and showed the alacrity with which the firemen handle fire calls, and how the rescuing of women and children is accomplished.

On the last day of the campaign, several hundred members of the Junior Division of the Safety Council congregated on Twelfth Boulevard and were addressed by Colonel Philip Brockman, President of the Board of Police Commissioners, on "How Boys Can Assist the Police Department in Eliminating Accidents."

Removing Snow and Ice from Sidewalks by Municipal Action

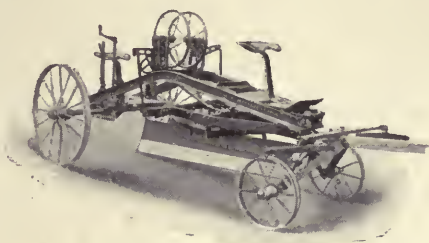
IN common with most northern cities, Newark, N. J., has long had an ordinance which places upon owners or other custodians of property, occupied or vacant, an obligation promptly to remove snow and ice from the sidewalks and gutters. And Newark has also had the all too common experience of violation of this ordinance by those responsible for carrying out its provisions.

During the heavy falls of snow last winter, conditions on many of the city's sidewalks and gutters became so bad that an amended ordinance was adopted which included the following section:

Two Good Resolutions for 1924

Build Good Roads

Use Good Road Machinery



Little Winner Road Grader.
The Winner is made in six sizes.



Champion Crusher, Mounted, with Elevator
Screen and Bin.



Monarch Steam Roller.
The King of the Road.

These two resolutions really go together. You must have machinery to build good roads. You should have the machinery that will give you the most satisfaction in its use.

We furnish a complete line of Road Building Machinery, including, Road Graders, Rock Crushers, Road Rollers, Road Drags, Oiling Machinery, Heating Kettles, Car Unloaders, Gravel Screening Plants and Culvert Pipe. Anything you want we can supply.

We offer unexcelled service through our four factories and many branch offices and distributing warehouses. Service counts and is worth much to you.

Ask for catalogue "Everything for the Road Maker." It is free and will interest you.

The Good Roads Machinery Company, Inc.

Kennett Square, Pa.

905 Tower Building.....	CHICAGO, ILL.
Oliver Building.....	PITTSBURGH, PA.
61 Oliver Street.....	BOSTON, MASS.
50 Church Street.....	NEW YORK, N. Y.
Commercial Trust Building.....	PHILADELPHIA, PA.
67 Whitehall Street.....	ATLANTA, GA.

"In addition to the penalties hereinabove provided, if the owner or owners, tenant or tenants of any such premises shall neglect or refuse to comply with this ordinance, it shall be the duty of the Chief Engineer of the Division of Works of the Department of Streets and Public Improvements to forthwith remove such snow and ice. The said Chief Engineer of the Division of Works of the Department of Streets and Public Improvements shall thereupon certify to the Board of Commissioners the cost of such removal, which cost shall be charged against the lands abutting or bordering upon such sidewalks or gutters, and the amount so charged shall forthwith become a lien upon such land, and shall be added to and become and form part of the taxes next to be assessed and levied upon such lands and shall bear interest at the same rate as taxes, and shall be collected and enforced in the same manner as taxes."

As a result of this new provision for municipal action in cases of individual laxity, Newark's sidewalks and gutters will undoubtedly be in much better condition during the present winter than ever before.

Making Coasting on Streets Safe for the Children

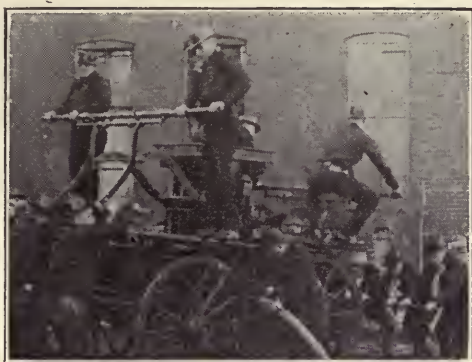
LAST winter an increasing number of cities in the snow belt adopted the plan of designating certain streets for coasting purposes. An attempt was made to furnish police protection at the intersecting streets, but such protection did not prove adequate in all cases. As a result of last year's experience, the following suggestion has been made editorially by the *Newark Evening News*:

"It is too much to hope for that coasting in the city can be made completely safe. It could be made a lot safer than it was the last year, however. Where it is possible to station policemen at the crossroads, that should be done, but there is an additional and automatic safeguard possible. The Director of Public Safety should provide the requisite number of traffic signs for each cross-street, possibly painted red and bearing a legend: 'Public Coasting Street—Come to a Full Stop Before Crossing.' This would warn the strangers and leave the reckless no excuse. It might be backed up with an ordinance."

History of St. Louis Filmed

ST. LOUIS claims the distinction of being the first city in the United States to produce a civic film narrating the history of the city. "The Spirit of St. Louis," a seven-reel photoplay, has been filmed with a view to acquainting the citizens of St. Louis with the interesting story of the founding of their community and with the important part which the city has played in the history of this country.

A motion picture committee was appointed by the Mayor to handle the project, and a group of citizens underwrote the production, advancing the necessary funds with the understanding that the exact amount invested by each person should be returned out of the proceeds from theatrical rentals, the profits to be devoted to putting prints of the film into schools and free motion picture libraries. The Rothacker Film Manufacturing Company of Chicago was selected to produce the picture, and over a year was spent in collecting historical data and film-



RELICS OF THE VOLUNTEER FIRE COMPANY DAYS IN ST. LOUIS

Lent by the Missouri Historical Society for the scene showing the great fire of 1849, in the St. Louis historical film. The "fire engines" were pumped by hand, and the water-supply was contained in cisterns

ing the scenes. Every actor in the cast was a citizen of St. Louis, and a number of talented volunteers were found to play the leading roles.

The film has been planned with a view to making it acceptable for exhibition throughout the country. There is a definite plot running through the play, and the historical episodes are blended into it in such a way as to make the film interesting not only to Missourians but to people in other states as well. The opening scene shows the departure of Laclède from New Orleans in 1762, accompanied by about two score men, women and children, on their way to found a trading post far up the Mississippi, and then follow portrayals of the outstanding features in the development and history of the city. Two of the most spectacular scenes in the film are the Indian attack on the village in 1780 and the great fire of 1849. For the latter episode, relics of the fire-fighting equipment of many years ago were borrowed from the Missouri Historical Society. Members of the present fire department put the old apparatus in working order, donned the quaint costumes of olden days and fought the fire with hand-pumped engines. The picture closes with a few scenes showing the St. Louis of to-day.

The producers will lend a print of the film to municipal officials or responsible civic organizations desiring to inspect it.

Ordinance for Distribution and Sale of City Documents

A N ordinance was recently passed by the City Council of Chicago providing for the sale and distribution of copies of city documents and publications of the Bureau of Statistics and Municipal Reference Library, at a price to cover the cost of paper, handling and printing. The sale of these publications will be in charge of Frederick Rex, Municipal Reference Librarian. Heads of departments, boards, council committees and other divisions of the city government will be required to turn



1. Loading snow from windrows, the common practice with Barber-Greene Snow Loaders.
2. Showing how the Barber-Greene, in extremely cold weather that would discourage many shovel men, handles snow that is almost entirely ice.
3. Showing the Barber-Greene handling large lumps.
4. Truck loaded by a Barber-Greene—higher than shovelers could throw.
5. In Albany a Barber-Greene loaded 45 trucks an hour last winter.



Why cities are planning to fight their snow battle with Barber-Greene's

Philadelphia's weather records give us every reason to believe that we shall have considerable snow to remove this winter. These reports, covering 250 years, show an average of 22.2 inches of snow a year, and for the last ten years — an average of 25.9 inches.

This data, and the Weather Bureau's figures for the entire country, show that our winters are bringing as heavy snows as the country has ever known.

Because of the greater dependence on transportation of all kinds, this snow must be removed more quickly than formerly, unless business is to suffer heavy losses. In many cities, Barber-Greene's are speeding up snow removal and cutting its costs to a minimum. Their demonstrated saving is more than 50% of the cost of hand-shoveling methods.

Boston "L" officials estimate that their Barber-Greene does the work of 150 to 200 men. They express their enthusiasm in convincing terms: "We would not take \$50,000 for the Barber-Greene Loader if it could not be replaced."

Albany says: "It is thirty times as fast as hand labor. With it we hung up a record of loading 45 trucks per hour. On account of labor shortage we could not have got anything done at all, and the loader 'saved our lives'."

Schenectady, Philadelphia, Albany, Pittsburgh and Chicago are among the many other cities that are using Barber-Greene's in their snow-fighting campaigns.

Send for the book, "Mechanical Snow Handling," which describes the Barber-Greene and the new side discharge design.

BARBER-GREENE COMPANY—Representatives in 33 Cities—515 W. Park Avenue, Aurora, Illinois

BARBER  **GREENE**
SNOW LOADERS

over to the Municipal Reference Librarian at least once each year, for sale or distribution, all publications in their charge not required for further use. No publications shall be sold by any department or other division unless the sale is authorized by the City Council.

The number of copies to be printed of any edition of an annual or special report must be approved by the City Council, and a board consisting of the Municipal Reference Librarian, a representative of the Finance Committee of the City Council and the head of the department issuing the report, will decide as to the number of copies to be set aside for use by the department and the number to be distributed or sold by the Librarian. City and county officials, libraries within the state of Illinois, newspapers and civic organizations in Chicago may receive copies of publications free of charge.

This is believed to be the first ordinance of its kind passed by any city in the United States.

Municipal Art Commission Organized in Portland, Ore.

AN ordinance creating a Municipal Art Commission for Portland was adopted in December by the City Council. This Commission will consist of the Mayor and seven other members to be appointed by him, one to be chosen from each of the following bodies—Portland Art Association, Portland Art Class, Arts and Crafts Society, School Art League, American Society of Civil Engineers, American Institute of Architects, and one to be a professional landscape architect. These members must all be residents of the city of Portland.

Under the provisions of the ordinance, no statue, monument, memorial tablet, fountain, or other ornamental structure may be erected in any public place in the city or in any building owned by the city until the design and location of the work of art have been submitted to the Council. The matter will then be

referred to the Art Commission for its advice concerning the work of art and its proposed location. When the Council decides in favor of acceptance, the approval of the design and location will be expressed by ordinance. The ordinance also requires that no work of art now in the possession of the city may be relocated or altered in any way without the approval of the Art Commission.

Two Angels of the Waterfall

THE following lines are adapted from a publication of the Winnipeg Hydro-Electric System. To discriminate wisely between the rival claims of these two angels of the waterfall is one of the many difficult and recurring problems of modern civilization:

"At every waterfall two angels stay;

One rainbow-clothed, the other veiled in spray.

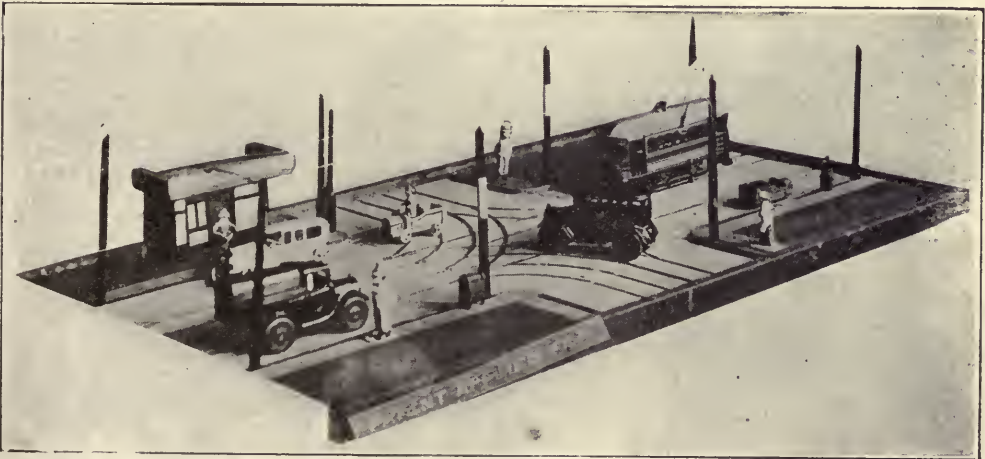
The one the beauty of the scene reveals;

The other moves the mighty water-wheels.

*And there these white-robed sisters ever stand,
Utility and Beauty, hand in hand."*

Model an Aid in Traffic Trials

AN adjustable model illustrating street conditions, for use in the traffic courts of Springfield, Mass., to facilitate the presentation of evidence in traffic violation and accident cases, has been constructed by Ellsworth C. Meyers, master mechanic of the Springfield Police Department. This model, which is shown in the accompanying illustration, is about 3 feet long and 2 feet wide, and may be placed on a table close to the witness stand when used in court. The surface of the model shows an intersected street with trolley lines running in both directions. When illustrating an accident which occurred on a street without trolley lines, a piece of sheet metal is fitted over the tracks. The sidewalks, electric light and telegraph poles, fire hydrant, vehicles and pedestrians, represented in miniature on the model, can be adjusted to indicate conditions as they were at the time of the accident.

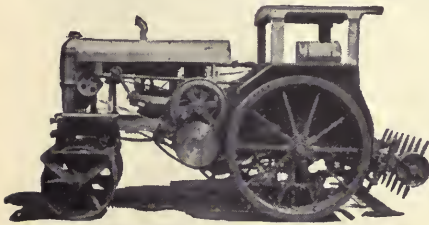


Photograph by courtesy of the Automobile Club of Springfield, Mass.

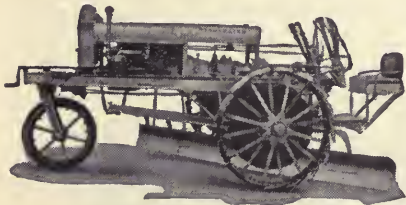
MODEL USED IN THE TRAFFIC COURTS OF SPRINGFIELD, MASS., TO SHOW STREET CONDITIONS IN TRAFFIC VIOLATION AND ACCIDENT CASES



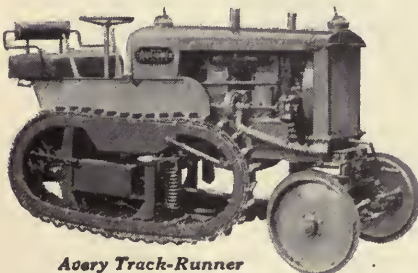
Avery Machines That Save Road Building Dollars



**Avery Combination 10 Ton Tractor—
with Power Scarifier**



Avery One-Man Road Razer



Avery Track-Runner

Here are Avery Machines that are answering big problems for road builders and public officials. You will want to know more about them if your problem is to build and maintain good roads and streets at lowest cost.

First you will be interested in the new Avery Combination 10-ton Tractor-Roller with Lower Scarifier. This is the most practical machine ever offered for reconstructing stone, gravel and oil or water bound macadam roads and streets at low cost. With this Scarifier you can put the surface into workable conditions, with the Tractor and Grader you can reshape and crown the highway and with the Roller you can put on the finishing touches.

The Avery One-Man Road Razer, answers your problem in maintaining dirt or gravel roads and streets. It shaves the roughest, ruttiest, cut-up surface with remarkable speed and economy. Entirely a one-man outfit—power and blades all in one unit. Has special blade for use in snow removal.

The Avery Track-Runner, is an all purpose tractor and runs on a roller bearing track. Fills a seven or eight foot road grader and medium sized road levelers and maintainers. It is the ideal and practical tractor for street and road building work. Can be equipped with snow plow for snow removal.

See These and Other Avery Machines at the Good Roads Show at the Coliseum in Chicago January 14 to 18

Write for Avery circulars showing the complete line of Avery tractors, road building, maintenance and snow removal machines.

AVERY COMPANY, 223 Iowa St., Peoria, Ill.

BRANCH HOUSES: Madison, Fargo, Omaha, Minneapolis, Grand Forks, Sioux Falls, Aberdeen, Billings, Lincoln, Sidney, Nebr., Des Moines, Indianapolis, Columbus, Kansas City, Wichita, Salina, Stuttgart and Sacramento

DISTRIBUTORS: Avery Company of Texas; Dallas, Amarillo and Beaumont, Texas

Also Other Principal Machinery Centers

AVERY

Road-Building, Maintenance and Hauling Machinery

Municipal and Civic Publications

Prices do not include postage unless so stated

The Principles of Insect Control.—By Robert A. Wardle, M.Sc., Lecturer in Economic Zoology in the University of Manchester, and Philip Buckle, M.Sc., Lecturer in Agricultural Zoology in the University of Durham. Longmans, Green & Co., New York. 1923. XVI + 295 pp. Views, diagrams, tables. \$6.00.

This volume is an attempt to cover the whole field of insect control in a usable treatise, based on a study of a vast amount of authoritative literary material and of the work of many of the agricultural experimental stations in the United States and Canada in the summer of 1921. The illustrations include many different kinds of sprayers and dusters. The methods of control are treated under four large divisions—biological, chemical, mechanical, and legislative. The Appendix of 21 pages explains and illustrates the principles and use of insectical machinery. A comprehensive bibliography is given.

Crime and Correction.—By Col. V. M. Masten, Military Head of the New York State Reformatory. Richard G. Badger, The Gorham Press, Boston. 1923. 257 pp. \$2.00.

A unique expression of the common-sense view-point in dealing with the causes of crime and its results and remedies, written with the principle in mind that "They have a right to censure that have a heart to help." Among its direct statements, space permits quoting the following: "None but the open-minded, who fit themselves comprehensively for it, should be trusted to guide stumbling children of the kind commonly brought before children's courts." "Pure play in free air is the last thing any man should put aside. Pure play is also the last thing in the minds of diverse players, who shove crass counterfeits of it, alike in 'movie' theatres and on fields of recreation, in effect signally to ride, exploit, rob, derail, and denature America's younglings."

Child Labor and the Constitution.—By Raymond G. Fuller, Executive Director, The Helen S. Trounstine Foundation (for Social Research); formerly Director of Research and Publicity, National Child Labor Committee. With an Introduction by John H. Finley, formerly Commissioner of Education, State of New York. Thomas Y. Crowell Company, New York. XVI + 323 pp. 1923. \$2.50.

An up-to-date view of this subject, acknowledging that the worst evils of the past have been largely abated; distinguishing between child labor (depriving children of health, play and schooling) and child work (wholesome, purposeful occupation); and maintaining that while child-labor reform must still include compulsions and prohibitions, its biggest task is to develop schools "with a stronger holding power of their own, a varied curriculum and a flexible grading system, educational and vocational guidance, vocational placement, and employment supervision." The problem is actually one of individual cases, and the constructive rather than the preventive point of view is consistently presented in this volume.

Indiana Sanitary and Water Supply Association.—Proceedings of the Sixteenth Annual Convention, held at Indianapolis February 14, 15, 1923, in affiliation with the State Board of Health. 97 pp. Including papers and discussion on many phases of the operation of water-supply systems, sewage disposal plants, and fire protection departments. (Apply to C. K. Calvert, Secretary, Indiana Sanitary and Water Supply Association, 1902 N. New Jersey Street, Indianapolis, Ind.)

California Housing Handbook.—Containing the State Housing Law of California. Annotated, illustrated and indexed by Mark C. Cohn. Officially approved and issued under direction of the Pacific Coast Building Officials Conference. Designed to make the intent of the act more readily understood from a practical view-point and to facilitate compliance with it. Containing suggestions which should promote better building and encourage the conserving of the present supply of housing. 113 pp. \$1.00 postpaid. (Apply to Mark C. Cohn, 512 Foxcroft Building, 68 Post Street, San Francisco, Calif.)

The Elementary School: A Study in Fundamental Principles.—By John Louis Horn, Associate Professor of Education, Mills College. The Century Co., New York. 1923. XVI + 422 pp. \$2.00 postpaid.

A survey of the entire field of elementary education. The author advocates a complete reorganization of the elementary school system, so that the power now held exclusively by superintendents be shared with principals and teachers. He also suggests that the state itself organize and maintain a state-wide system of schools for public education in place of the present district, city and county systems. The book is arranged for classroom use, and the main body of the material is presented under the subjects of the relation of the school institution to the community, problems of organization, and problems which primarily involve instruction.

Home and Community Hygiene.—By Jean Broadhurst, Ph. D., Associate Professor of Biology, Teachers College, Columbia University. Second edition, revised and enlarged. J. B. Lippincott Company, Philadelphia. 1923. XV + 444 pp. 118 illustrations. \$2.50.

A text-book covering the field of disease prevention and health conservation in an elementary, authoritative way, from the practical standpoint of the home-maker. There are chapters on bacteria, the human mechanism, food, milk, water, air and ventilation, sewage and refuse disposal, the transfer, treatment and prevention of disease, summer camps, schools, infant welfare, tuberculosis, vital statistics, health education and administration, etc.

Institutional Household Administration.—By Lydia Southard, B. A., House Director of Whittier Hall and Instructor in Institution Administration, Teachers College, Columbia University, New York City. J. B. Lippincott Company, Philadelphia. 1923. 214 pp. 91 illustrations. \$2.00.

A book that has application to the needs of those in charge of public institutions where a number of people are living together. It can be used in the classroom, or as a manual for the individual house-keeper. The principles of buying are included, and all the important details of household furnishing and management.

Grade and Surface Guides.—By Howard F. Hobbs. Published by The Mohawk Rubber Co., Akron, Ohio. 1923. 24 pp. 17 cents each, postpaid.

The three guides at hand cover the Southern Route from Denver to Los Angeles, the Santa Fé trail between the same cities, and the Los Angeles-San Francisco Tour. They are designed to help motorists to plan intelligently and to enjoy their trips over these main trunk highways, by knowing all about the road surface, what everything costs and where best to buy it. The guides will be revised annually. The running chart shows an exaggerated profile of the road, with the character of the surface. The many maps are of great aid. The text gives mileage, facilities—tourist camp grounds, hotels, garages, etc., and many other interesting and important details. The guides are of the size and shape of railroad time-tables, easy to carry and handle.

Transit: A Part of the Pittsburgh Plan.—Report No. 3 of the Citizens Committee on City Plan of Pittsburgh, published September, 1923. 58 quarto pp. Maps, diagrams, tables. 50 cents. This report is confined to such phases of the transit problem of Pittsburgh as may be expected to have a direct bearing upon the development of some part of the regional or city plan. Municipal boundary lines are disregarded. (Apply to George Ketchum, Executive Secretary of the Committee.)

Public Roads.—Report of Thos. H. MacDonald, Chief of the Bureau of Public Roads, Washington, D. C., released December 17, 1923. 32 pp. Covering the fiscal year ended June 30, 1923, and summarizing the salient facts as to expenditure of funds, mileage completed, and work under construction; reporting in full on the Bureau's work involving scientific research regarding roads and agricultural engineering. (Apply to the Government Printing Office, Washington, D. C.)



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City Problems.—Proceedings of the Fourteenth Annual Meeting of the Conference of Mayors and Other City Officials of the State of New York, held in Buffalo June 12-14, 1923. 138 pp. Containing reports, addresses and discussions on many phases of municipal and civic affairs. \$1.00. (Apply to William P. Capes, Secretary of the Conference, Albany, N. Y.)

Meter Installations and Meter Rates.—By E. I. Roberts, Assistant Engineer, State Department of Health, Columbus, Ohio. 9 pp. Charts and tables. This study covers 150 cities and villages. (Apply to the Ohio State Department of Health.)

Atlanta's New Traffic Law.—"How—When—What to Do When Driving or Walking on Atlanta's Streets." 24 pp. Illustrated. Presenting in understandable language the law's requirements on problems encountered every day. (Apply to the Atlanta Motor Club, Headquarters, Ansley Hotel, Atlanta, Ga.)

Electrical Code, Chicago, Ill.—Rules and Regulations of the Department of Gas and Electricity of the City of Chicago for the installation of wires and apparatus for electric light, heat and power, and for the construction and installation of electric signs and displays. 1923. Handy size. 281 pp. 20 cents postpaid. (Apply to John T. Miller, Commissioner of Gas and Electricity.)

Mind Your Business.—The first number (October 23, 1923), of a 4-page folder issued weekly by the Bureau of Municipal Research, 1210 Fullerton Building, St. Louis, Mo. (Apply to the Bureau.)

Special Report on Cardiac Classes, New York City.—The results of a very extensive survey by a committee of the Association for the Prevention and Relief of Heart Disease, made since 1916. Containing information and recommendations on the first of three headings of the inquiry: "To determine the actual number of the children having damaged hearts, the severity of the damage, and the average rate per thousand of registered children; the correct answer to these questions will determine the number to be cared for, the need of segregation of the group and the number requiring transportation." (Apply to William L. Ettinger, Superintendent of Schools, 500 Park Avenue, New York, N. Y.)

Parks: A Part of the Pittsburgh Plan.—Report No. 4. Citizens Committee on City Plan of Pittsburgh. September, 1923. A study of existing facilities, with recommendations for improvement of existing areas, and for a city-wide system (a distribution plan) of neighborhood parks to be coordinated with playgrounds and athletic fields. It also discusses metropolitan district and other problems. 76 quarto pp. Views, maps, diagrams, tables. (Apply to George Ketchum, Executive Secretary, Citizens Committee on City Plan of Pittsburgh.)

Taxation in New York State.—Annual Report of the State Tax Commission for 1922. 530 pp. In addition to many details of tax rates, bonded debts, etc., of cities in New York State, this report contains a valuable compilation of information on tax matters from other states. (Apply to State Tax Commission, Albany, N. Y.)

Planning Projects for Elkhart, Ind.—Report on Planning Proposals Based on Planning Survey. By John Nolen, A. M., Sc.D., city planner, and Philip W. Foster, associate. Prepared for and presented to the city of Elkhart by the Elkhart Chamber of Commerce and subscribers to a city plan fund. With a supplement on zoning. 24 quarto pp. Maps, and many views. Summing up the recommendations that have been made for the improvement of the present conditions in the city and outlining the way in which new growth and development should be guided and controlled. (Apply to E. Hill Turnock, Chairman, Chamber of Commerce Committee on City Plan, Elkhart, Ind.)

Some Compressive Tests of Hollow-Tile Walls.—By Herbert L. Whittemore, Mechanical Engineer, and Bernard D. Hathcock, Laboratory Assistant, U. S. Bureau of Standards, Washington, D. C. Bureau Technologic Papers No. 238. July 21, 1923. 16 pp. Illustrated. The investigation was planned by J. H. Griffith, of the Bureau of Standards, in cooperation with the officials of the National Fire Proofing Co., with the advisory assistance of A. V. Bleining, of the ceramics division of the Bureau, and in cooperation with a committee of the American Society for Testing Materials. 5 cents. (Apply to the Superintendent of Documents, Government Printing Office, Washington, D. C.)

Diary and Manual of the Real Estate Board of New York.—Twenty-eighth Annual Edition, 1924. 301 pp. Map showing height and area districts of the borough of Manhattan. The diary pages contain reminders to the taxpayer of federal, state, and local obligations. The remaining pages contain information of interest to property owners, tenants, lawyers, architects, and all others who have to do with real estate. \$2.00. (Apply to the Real Estate Board of New York, 7 Dey Street, New York, N. Y.)

Relations of Highways and Motor Transport to Other Transportation Agencies.—Report of Special Committee IV appointed by the President of the Chamber of Commerce of the United States; Alfred H. Swayne, Vice-President, General Motors Corporation, New York, is Chairman. Issued November 2, 1923. 44 pp. Outlining a comprehensive plan for linking organized motor transport with the railroads in the development of a balanced national system of transportation. (Apply to Julius H. Barnes, President of the Chamber of Commerce of the United States, Washington, D. C.)

Chicago, Ill.—Report of Hon. William E. Dever, Mayor, dated October 17, 1923. (Apply to the Mayor.)

Kansas City, Mo.—Report of the Fire Department for year ending April 16, 1923. (Apply to Alex Henderson, Chief, Fire Department.)

Kansas City, Mo.—Annual Report of Department of Water, Light and Power for 1922. (Apply to L. H. Chapman, Commissioner of Water, Light and Power.)

New York, N. Y.—Seventeenth Annual Report of the Board of Water Supply for 1922, accompanied by the Report of the Chief Engineer. (Apply to the Board of Water Supply, Municipal Building, New York, N. Y.)

Salt Lake City, Utah.—Annual Reports of the City Engineer for 1921 and 1922. (Apply to Sylvester Q. Cannon, City Engineer.)

On the Calendar of Conventions

JANUARY 14-16.—NEW YORK, N. Y.

American Society of Landscape Architects. Annual meeting. Secretary, Bremer W. Pond, 18 Tremont Street, Boston, Mass.

JANUARY 14-19.—CHICAGO, ILL.

American Road Builders' Association. Annual convention. Secretary, Ethel A. Birchland, 37 West 39th Street, New York, N. Y.

JANUARY 15-17.—RICHMOND, VA.

League of Virginia Municipalities. Annual convention. Secretary, Morton L. Wallerstein, 408 Travelers Building, Richmond, Va.

JANUARY 16-17.—GRAND ISLAND, NEBR.

League of Nebraska Municipalities. Annual meeting. Secretary, Theo H. Berg, City Hall, Lincoln, Nebr.

JANUARY 16-17.—WASHINGTON, D. C.

Public Superpower Conference. Called by the Public Ownership League of America, and its affiliated organizations. Address the headquarters of the League, 127 North Dearborn Street, Chicago, Ill.

JANUARY 16-18.—NEW YORK, N. Y.

American Society of Civil Engineers. Annual meeting.

Secretary, John H. Dunlap, 33 West 39th Street, New York, N. Y.

JANUARY 25-26.—WINCHENDON, MASS.

New England Association of Commercial Executives. Quarterly meeting. Secretary, George F. Wells, Chamber of Commerce, Lowell, Mass.

FEBRUARY 7-8.—ST. PAUL, MINN.

Minnesota Association of Community Secretaries. Annual meeting. Secretary-Treasurer, H. F. Dooley, Fairbault, Minn.

FEBRUARY 13-15.—ATLANTIC CITY, N. J.

New Jersey Mosquito Extermination Association. Annual meeting. Secretary, Thomas J. Headlee, New Brunswick, N. J.

FEBRUARY 27-29.—TORONTO, ONT.

Ontario Good Roads Association. Secretary, S. L. Squire, 98 Albany Avenue, Toronto, Ont.

MAY 19-24.—NEW YORK, N. Y.

American Water Works Association. Annual convention. Secretary, J. M. Diven, 153 West 71st Street, New York, N. Y.

With a Complete Line of Traffic Control Units

AT the Chicago Good Roads Show, our full and complete line of Essco "Stop & Go" signals will be shown. There is a proper style and model for every particular installation. No two street intersections can be solved by identical installations.

Our traffic engineers work out these problems for you without charge.



The Universally Approved

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News and Illustrations

Items of Interest to City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

New Assistant General Manager

The Wood Hydraulic Hoist and Body Company, 7923 Riopelle Street, Detroit, Mich., has announced that Frank H. Dewey, for two years Sales Engineer, has been made Assistant General Manager and will devote his time to the direction of sales promotion and advertising in cooperation with manufacturers and dealers.

Ahrens-Fox Pumper Wins "Drafting Water Contest"

At the Burlington County Firemen's Day at the Mount Holly Fair in New Jersey, the Relief Engine Company of Moorestown, N. J., won the "drafting water contest" with its 600-gallon Ahrens-Fox pumper. The contest was held under the following conditions: Ten men started from a line 100 feet from the engine which was standing "dead" at a tank holding 5,000 gallons of water. The men ran to the engine, connected the two suction, put on the screen and threw the connected suction into the tank, then ran off 200 feet of connected 2½-inch fire hose, connected the hose to the pump, started the motor, started the pump, and forced water through the hose at 100 pounds pump pressure. The Relief Engine Company had a stream out of the nozzle in 25 seconds, which was 8 seconds ahead of the nearest com-

petitor, thereby winning the first prize, an attractive silver cup. There were six other competitors in the contest, with pumps ranging from 500 to 800 gallons capacity.

This information and the illustration were furnished through the courtesy of Evan F. Benners, Secretary, Relief Engine Company, Moorestown, N. J.

Cheap Power for Road Machinery

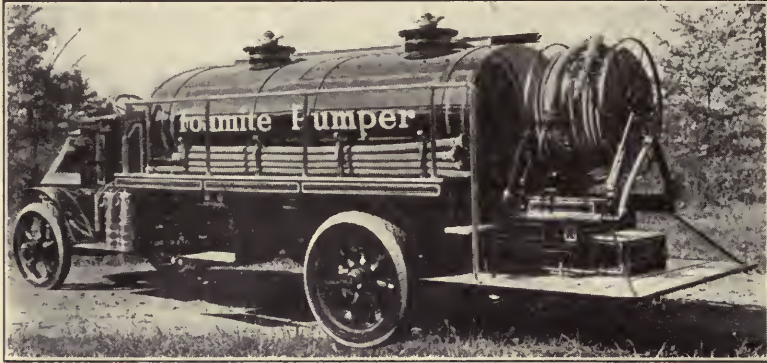
The big highway problem is the cost of construction and cost of maintenance of the roads. For this reason, highway and street officials as well as road contractors are investigating more and more the value of tractors in handling road-grading machinery, maintenance equipment and snow-removal equipment. For the straight hauling of elevating graders, blade graders and large drags, the tractor is unsurpassed, and when it comes to keeping roads open in winter, tractors are supreme in handling pusher plows, V-type plows and the new rotary plows which have been developed.

The Bear tractor, made by Bear Tractors, Inc., 5330 Park Place, New York City, has commanded attention because of its fine automotive engineering, quality of construction and operation. This machine is not only adaptable to summer-work and snow removal, but is be-



THE RELIEF ENGINE COMPANY'S AHRENS-FOX FIRE ENGINE, WITH THE CREW WHICH WON FIRST PRIZE AT THE MOUNT HOLLY FAIR, MOUNT HOLLY, N. J.

New Foamite Pumper a big success at Richmond Convention



Foamite Pumper, 1400-gallon capacity, on Mack 7½-ton chassis—designed and manufactured by Foamite-Childs for municipal use in fighting fires, in oil, grease, paint, benzol, etc.

Latest application of *Foamite* Protection proves its value before 500 Fire Chiefs.

THE *Foamite* method of controlling extra-hazardous fires is now available for municipal protection in a large-capacity *Foamite* tank and pumping car. Experienced fire-fighters everywhere will recognize the significance of this big step ahead.

Carrying 700 gallons of each chemical solution, the Pumper can produce enough Firefoam and force it far enough to subdue fires of gasoline, oil, chemicals, paint, grease, etc., even in advanced stages. A twin rotary pump unit delivers 560 gals. of foam per minute against a working pressure of 100 pounds. For dependable power and speed in reaching a fire, the *Foamite* Pumper is



The *Foamite* Splash Proof Extinguisher, indispensable first-aid equipment for "extra hazardous" fires.

mounted on a 7½-ton Mack chassis.

The *Foamite* Pumper is designed for use in municipalities having the following risks to protect: small refineries, filling stations, dry cleaning establishments, bulk oil storage stations, paint and varnish works, plants using dip tanks, water-front property and ships. Also for use on fires where water will destroy valuable materials or products.

In a word, the *Foamite* Pumper is intended for emergency service. How well it performs that service was proved at Richmond.

The engineering knowledge and skill that perfected the *Foamite* Pumper are the same that have produced and placed *Foamite* Protection in leading industrial plants and on the properties of the principal oil companies and public utilities.

Write for folder containing complete data and specifications of the 1400-gallon *Foamite* Pumper.



The test at Richmond—photo above shows fire burning in a pit, area 400 sq. ft., containing 1,050 gals. of gasoline and oil. Timed by Chief Emrich, of Baltimore.



The flames were allowed to rage for 3 minutes. Then Firefoam was thrown on from the *Foamite* Pumper. In 1½ minutes the fire was under control; in less than 3 minutes it was extinguished.



Photos by Fire & Water Engineering
Fire Chiefs observing result—oil surface and sides of pit covered with Firefoam. Only 100 gals. of each chemical solution were used. Three-fourths of the oil remains unburned.

Foamite-Childs Corporation

Fire Protection Engineers and Manufacturers

347 Turner Street, Utica, N. Y.

Sales and Engineering Representatives in the leading cities of all countries



BEAR TRACTOR WITH AN AUSTIN SCARIFIER BREAKING UP AN ASPHALT MACADAM PAVEMENT IN SHERMAN PARK, CHICAGO, ILL.

ing used every day in the year where all kinds of road and contracting jobs are under way. This tractor is equipped with a 4-cylinder engine and is cooled with a direct sectional radiator and a gear-driven fan delivering 9,000 cubic feet of air per minute over the surface of the engine. The track, which gives traction in all kinds of going, is a drop-forged continuous-tread track which runs dry, with each unit easily detachable. The tread wheels, both front and back, are 36 $\frac{5}{8}$ inches in diameter. The length of the tread is 64 inches on the ground, and it is 12 inches wide, giving an area of 1,536 square inches of tread surface on the ground and a ground pressure of 3 $\frac{1}{2}$ to 3.9 pounds per square inch.

The turning radius of this machine, which weighs 6,000 pounds when completely loaded with fuel oil and water, is 6 feet and it operates at 5.9, 3.4 and 2.1 miles per hour forward and 2 miles per hour in reverse. Both treads are controlled by the steering wheel, which operates individual multiple disc clutches on the tread drivers. Five pounds pressure on the steering wheel operates the clutches. The net width is 62 $\frac{1}{2}$ inches, the height over the tracks 42 inches and over the radiator 54 inches, and the length is 125 $\frac{1}{4}$ inches.

High Schools Install Stokers

In the Paul Revere and the Moses Cleveland High Schools in Cleveland, Ohio, which have recently been completed, the city has installed Westinghouse new model Roney stokers. The improved Westinghouse side furnace doors, which have supporting angles, were also specified by Feldman Brothers, engineers and contractors for the work. These new stokers

will be driven by American Blower Company steam engines controlled by regulators. Each furnace will be equipped with the American suspended arch, which facilitates early ignition of the fuel, thereby reducing the combustible in the refuse to a minimum. The equipment includes a complete set of firing tools, grate-bars and hoes. The great care exercised by the engineers in selecting this equipment is reflected in the specifications for draft gages located so as to show the draft over the fire and at the stack damper. Either Ohio run of mine or slack coal of approximately 12,000 B. T. U. will fire these new 169-horse-power horizontal tubular boilers.

New Heil Distributors

The Heil Company, Milwaukee, Wis., manufacturers of tanks for all purposes, steel dump truck bodies and hydro-hoists for motor trucks, has announced the appointment of two new distributors, one at Toledo and one at St. Louis.

The Kranz Automotive Body Company, Gravois at Minnesota, St. Louis, Mo., has been appointed for that territory. The Shop of Siebert, 614 Southward Avenue, Toledo, Ohio, is the other new distributor. These two new distributors are the nineteenth and twentieth Heil Company distributors in the United States.

Book on Concrete Roads

The National Steel Fabric Company, 708 Union Trust Bldg., Pittsburgh, Pa., is distributing without charge to city engineers and street superintendents, as well as others interested in the subject, a book, by H. Eltinge Breed, on "Wire Fabric Reinforcement in Highway Design."

Illustration in an oil painting of one of the beautifully ornamented King Lighting Standards

Substantial, finely designed, richly ornamental, King Lighting Standards equipped with General Electric Novalux lighting units, are definitely the preference of many illumination engineers.

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ING MANUFACTURING CO
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A Rotary Snow-Plow for Clearing Suburban Highways

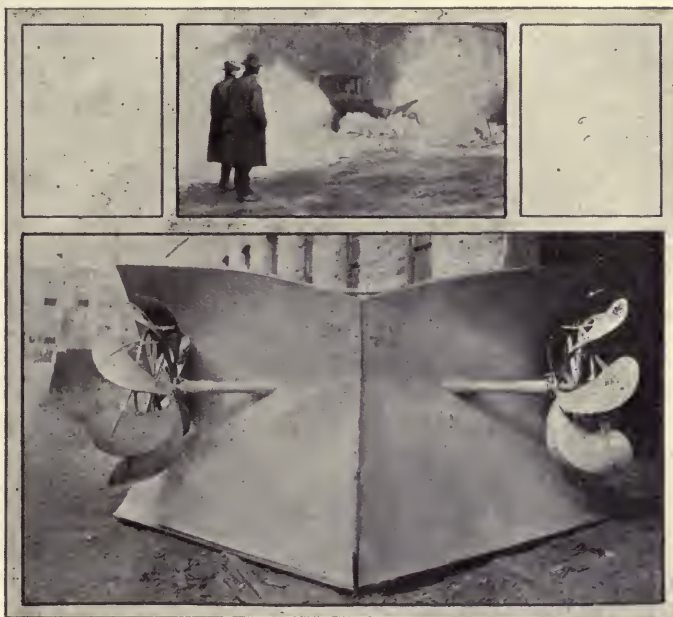
With the increased amount of suburban highway traffic, county and town officials are seeking for machines which will quickly and economically remove snow from the traveled way. In places where the snow is particularly heavy, ordinary types of snow-plows may not be able to cope with the situation, making necessary some kind of mechanical means for throwing the snow from the highway, in addition to the blade which opens the initial path. Two types of these plows are described below.

During the last three winters the "Snow King" lateral type rotary plow has been developed by the Rotary Snow Plow Company, 213-215 South Sixth Street, Minneapolis, Minn. Power for operating the lateral rotary fans which throw the snow to the sides is taken from the motor of the vehicle which propels the plow, thus permitting the use of tractors and trucks already employed as part of the equipment of counties and towns. This plow is divided into four parts—the plow proper, the rotaries, the transmission, and the hitch. The plow is of the snub-nose type, with specially designed wings, so curved as to bring the snow to the rotary fans with the least amount of friction. The wings do not touch the ground but are fastened to the top of the sliding shoes. The plow can be set to cut to the surface or leave as much of a cover as desired. Large set screws operated by hand wheels are provided to adjust the height of the plow above the shoe plates. The two rotary wheels, one on each side of the plow, revolve on ball- and roller-bearing equipped shafts. Their speed is one-third that of the motor, and the size varies from 3 to 5 feet in diameter, depending upon the size of the plow. They can be thrown in or out of gear separately and so revolve only when needed. The fans are of the bird wing type. They enter the snow without impact, thus reducing the shock to the motor parts. They throw the snow outward from 15 to 30 feet and as high as 20 feet. The power for driving the rotaries is taken from the motor of the propelling vehicle. It is transmitted by means of a shaft connected to the crank-shaft through a universal joint, so designed that if the rotary should strike an immovable obstacle the outside connection will give, resulting in no damage to the motor. The plow is attached to the propelling vehicle by means of a hitch designed to fit the particular type of tractor or

truck used. Large set screws operated by hand wheels are provided to adjust the depth of cut.

A Snow-Plow Tractor Combination

The Dallmann Machine & Manufacturing Company, 912 Winnebago Street, Milwaukee, Wis., has brought out a rotary snow-plow specially built for use with the Fordson tractor. This plow is designed to clear a single track instead of attempting to open the road to its full width in one operation. The plow can be driven in high gear through the average fall of snow and prepare a path wide enough for one-way traffic. The return trip over the same route clears the snow from the opposite side of the road. Power is taken from the tractor through a specially designed Smith unit, which instead of terminating in the conventional



A ROTARY SNOW-PLOW WITH LATERAL FANS

pulley, as in the ordinary Smith unit, transmits power through a pair of spiral beveled gears enclosed in a grease-tight housing through a heavy special composition steel propeller shaft, a sturdy, heavy-duty universal joint and forward-drive gears.

This plow, with the apron and snow propeller, rides on its own wheels, which are of the pivoting caster type. Since the entire mechanism is free to rise and fall with the inequalities of the road, all strain on the tractor as well as on the driving mechanism is eliminated. By the use of the Smith unit power take-off this plow can be used to buck heavy drifts, since the driver, when he sees a piece of difficult going ahead, can shift into low gear and allow the machine to slowly eat its way into the accumulation of snow with very little probability of stalling. In attaching this plow, brackets bolted on either side of the



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Chief of Police Says:**

A short time ago we purchased six new Harley-Davidsons after having received most favorable results from the Harley-Davidson during the last seven years.

These new machines have now been in use about four months and have proved without doubt to be the best equipped and most modern machines ever produced. For service, I cannot speak too highly in their favor.

The service rendered by your local dealer, Mr. George Carver, is the best possible.

C. P. Cronin
Chief of Police

**1924 Harley-Davidsons
have these Improvements**

1. Aluminum-alloy pistons. Smoother power. Less vibration. Prevents overheating.
2. Alemite lubrication. First on any motorcycle.
3. Full-floating Sidecar. 49-inch semi-elliptic springs make sidecar easier riding.
4. Handsome olive green finish, maroon striped.

One of the 1500

BINGHAMTON, New York, is one of the 1500 users of Harley-Davidson Police Motorcycles. Read what Chief of Police C. P. Cronin says (at the left). It is typical of the endorsements given this famous motorcycle by hundreds of city, county and state police organizations.

For running down motorized crooks, for patrol work and enforcing speed laws, and for many service duties, a Harley-Davidson soon pays for itself and thereafter earns a good profit for the department.

At a cost of only a few cents a day for maintenance, an officer's efficiency is increased many times with a Harley-Davidson. Average mileage cost is only two cents a mile—gas, oil, tires and all.

Ask your dealer about the improved 1924 models. Write for special Police Motorcycle literature. No obligation to you.

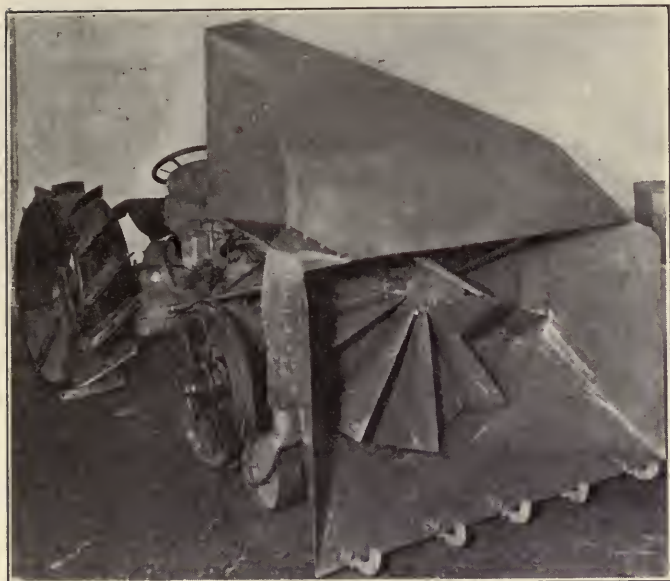
HARLEY-DAVIDSON MOTOR CO.

Dept. M

Milwaukee, Wisconsin

Harley-Davidson

The Motorcycle



ROTARY SNOW-FLOW MOUNTED ON SMALL TRACTOR

crank-case provide a pivoted anchorage. In attaching the brackets, the studs and nuts connecting the two sections of the Fordson crank-case are utilized, and thus require no drilling or tapping. The scooping action of the apron, combined with the forward motion of the tractor, piles the snow up in front of the propeller, which, rotating at high speed, goes into the snow, slicing it off and throwing it to the side of the road. The high speed at which the propeller works and the small quantity of snow handled by each blade at one time is said to provide a large volume of safety against clogging. This plow is provided with a chute

which throws the snow in one stream to the side of the road or deflects it into the gutter by means of an adjustable deflector hood—highly important for city use.

Boston Landscape Architect Moves

Sheffield A. Arnold, landscape architect, Boston, Mass., has announced his removal to 230 Clarendon Street, Boston, Mass.

A New Snow and Street Brush

Another use of the Fordson tractor is made possible by the new Detroit snow and street brush, which may be attached to the front of the tractor and used for cleaning either summer dirt or winter snow from streets and highways. It is claimed that this brush, made by Whitehead & Kales Com-

pany, Detroit, Mich., will handle snow 10 to 12 inches in depth, making a clean sweep and keeping the path clear for the Fordson itself. The brush is driven direct from the tractor motor and works ahead in plain view of the operator and can be maneuvered at will. It is simply constructed and covered with a guard, which is supported by a tubular frame perforated in front of the brush. A hose may be attached at the left side of the guard and also attached to a water-tank drawn by the tractor, thus making an effective sprinkling and sweeping unit for service when sprinkling is necessary to keep down the dust in summer.



A FORDSON TRACTOR EQUIPPED WITH ROTATING BROOM SWEEPER ATTACHED IN FRONT



SEND TODAY FOR THIS NEW BOOKLET !

Solvay Calcium Chloride has been approved by engineers wherever it has been used, and is today recognized as a necessary material for concrete curing.

It is for use in all concrete work, and for use in mortar, in setting brick. Its efficiency is not impaired by the weather. The action of Solvay enables brick work and concreting to proceed at exceptionally low temperatures, as it lowers the freezing point of water, at the same time hastening the action.

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Shipped in 375 lb. non-returnable drums or easy-to-handle 100 lb. moisture-proof bags from 50 convenient distribution points. Our new booklet "Concrete Summer and Winter" sent free on request.

SEMET-SOLVAY COMPANY, Dept. J., Syracuse, N. Y.



ILLUMINATED TRAFFIC DEVICE AT STREET INTERSECTION

An Improved Traffic Marker

There is no question about the necessity for some sort of device that will properly direct traffic day and night; in fact, the increasing number of motor vehicles makes this imperative. While some cities prefer traffic posts, the unfortunate number of accidents which occur by careless drivers knocking them over where they are not properly illuminated has led the Ohio Traffic Devices Company, 609-611 North Fourth Street, Columbus, Ohio, to bring out its new improved Ohio traffic marker.

This marker is a solid semi-steel heavily galvanized casting and lies in a direct line with the driver's vision on the roadway. The wiring, lens and lamps are securely protected from possible collisions or knocks, and the interior is made water-tight. It gives abundant illumination without glare, no excavation is necessary for installing the unit, and there are no pockets to collect water which might damage the wiring.

This unit is also made in a special low design for use between car rails, so that the height from the street surface to the peak is only 2½ inches. The non-electric type of the Ohio unit is used extensively as a "safety zone" and "no parking" marker.

Mushroom Traffic Light Patents

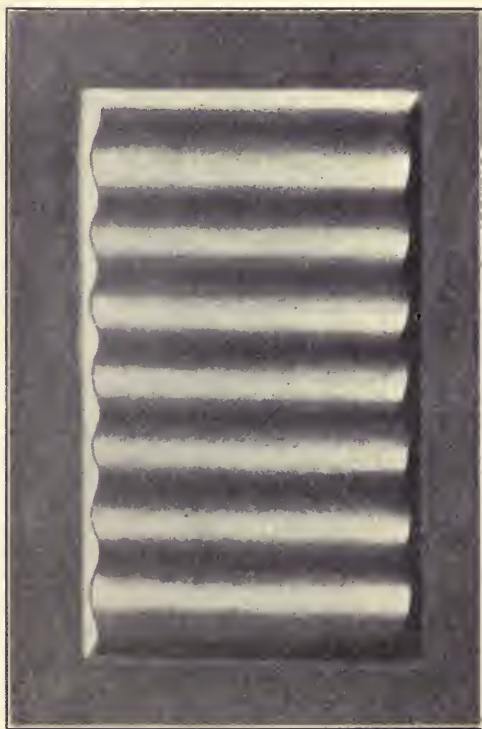
The Essco Manufacturing Company, Peoria, Ill., has announced that it has recently purchased outright all the patents, both domestic and foreign, on the Mushroom traffic light, so that this company is now the sole owner of the patents and is not operating as a licensed manufacturer.

Premolded Expansion Joints with Metal Reinforcement

An expansion joint which is claimed to perform all the required functions of such a joint in pavements, bridges and structures, is sold by the United States Asphalt Refining Company, 60 West Street, New York City, under the name "Aztec Expansion Joint." This joint is asphalt premolded with a metal reinforcement, the asphalt being from the same source as the well-known Aztec asphalt marketed by the company.

The joint depends on the expansive qualities of the asphalt for its service, and on the metal reinforcement, which stabilizes it and renders it easy to handle in long lengths. The joint is ½-inch in thickness and can be reduced under compression to 3.8 per cent of its original thickness, as against 50 per cent for some other types of joints. For shipment each strip of Aztec joint is wrapped in a special kind of paper which prevents sticking together. The reinforcement makes it proof against warping and bending.

This joint is in use by the State Highway Departments of New York, Pennsylvania, New Jersey and other states.



A SECTION SHOWING THE CONSTRUCTION OF THE AZTEC EXPANSION JOINT

READ "HINTS, HELPS AND HAPPENINGS" FOR FURTHER HELPFUL NEWS.

What Are You Doing to Protect Your Shade and Ornamental Trees?

NOW is the time to insure the health and beauty of your shade and ornamental trees, shrubs and vines. Many of their ails are controlled by the use of SCALECIDE as a dormant spray applied just before the leaves come out in the spring. It has been the standard spray for parks and cemeteries for nearly 20 years, and is known the country over as

"The Complete Dormant Spray"

SCALECIDE is economical to use because it goes so much further than lime sulphur, and it is easy and pleasant to apply. It does not injure the hands or face—in fact it is harmless even to the eyes. Nor does it mar the paint on buildings, trellises and fences.

SCALECIDE has been used for years by the park departments of Brooklyn and Bronx, New York; Boston; Buffalo; Rochester; Detroit; St. Louis; Oak Park, Illinois; Highland Park, Michigan; Milwaukee and many other cities noted for their well-kept parks.

Cottony Maple Scale and Lecanium Scale are easily controlled with SCALECIDE, one thorough spraying often being sufficient for two or three years. The fungicidal action of SCALECIDE helps to prevent decay and the entrance of disease in pruning wounds and other injuries to the bark—and many cankers start healing up. Scale insects, often very injurious to conifers, can be effectively controlled with entire safety by spraying with SCALECIDE in the spring just before new growth starts. Even Spruce Gall has given way to thorough treatment with SCALECIDE.

Send for our new booklet "The Ounce of Prevention." Please address Dept. 42.

B. G. PRATT CO. 50 Church St. NEW YORK CITY

SCALECIDE

THE COMPLETE DORMANT SPRAY

SCALECIDE



2½-TON DROP-FRAME TRAILER WAITING TO BE ATTACHED TO TRUCK TRACTOR

Note that the tractor is leaving the last trailer of the train of empty trailers. These trailers are used by the city of Milwaukee, Wis.

Trailers for City Hauling

The use of trailers in municipal work is increasing. Last spring six Highway trailers were installed in the Sixth Ward of Milwaukee for hauling ashes for about five miles. The reduction in cost for hauling and collecting amounted to 57 cents per cubic yard, which, on the basis of the total yardage hauled each year, made a saving of over \$200,000 to the city. Milwaukee has bought 200 complete outfits since that time.

A fleet of 42 trailers made by the Highway Trailer Company, Edgerton, Wis., is in use in Indianapolis, Ind., reducing the cost of collecting and hauling garbage to the incinerator from \$5.76 per ton to \$2.93 per ton. There is a fleet of 21 Highway trailers in Winnipeg, Canada, which has reduced the cost of collecting and hauling garbage from \$4.03 per ton to \$1.70 per ton. In Racine, Wis., the cost has been cut from \$6.87 per ton to \$3.72 per ton for the collection of garbage. The cities of Binghamton, N. Y.; Tacoma, Wash.; St. Louis, Mo.; Chicago, Ill.; Janesville, Wis.; St. Paul, Minn.; Kingston, Jamaica; Hongkong, China; and Shanghai, China, are also using this type of trailer.

The trailer is built so that it can be hauled by teams during the collection of garbage the same as a wagon. When the trailers are loaded, they are carted to a predetermined spot where they find an empty trailer waiting. The team is immediately disconnected from the loaded trailer and reconnected to the empty trailer, and the process of collection continues uninterrupted, the collectors going back into the district immediately instead of spending two-thirds of their time driving the slow team to and from the dump. The loaded truck takes the loaded trailers and pulls them in trains of from three to five to the incinerator or dump and returns with the empties, spotting them again for re-loading. In addition to the truck driver, there

is a brakeman on the trailer. Three teamsters, six trailers, one truck tractor, one truck driver, and one brakeman constitute a complete unit.

Attractive Lighting Brackets for Trolley Poles

The Westinghouse Electric & Manufacturing Company, George Cutter Works, South Bend, Ind., has brought out an ornamental lighting bracket to be attached to steel poles. This bracket, designed to make an efficient and attractive lighting standard out of a steel trolley pole, is known as the Columbia Trolleylite bracket. It may be either single- or double-arm, and is clamped to the pole, the clamps



A LIGHTING BRACKET THAT IS A DECORATION FOR ANY TROLLEY POLE

TO INCOMING AND PRESENT OFFICE HOLDERS:-

Some of you are about to assume responsibilities the character of which is unknown to you as yet.

Others are proceeding with knowledge gained by experience.

New Problems will confront both of you.

The completion of fifteen years' active service in municipal accounting, auditing and engineering with a successful record prompts the offer to you to aid in the solution of your problems, such as

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Respectfully,
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having adjusting bolts which insure perfect alignment of the arm or arms irrespective of the angle of the pole. The addition of an ornamental base increases the attractiveness. These bases are designed to be slipped over the trolley poles during erection or may be obtained "split" for use with poles already set. The lamps are placed at a height of 23 feet 4 inches from the level of the curb.

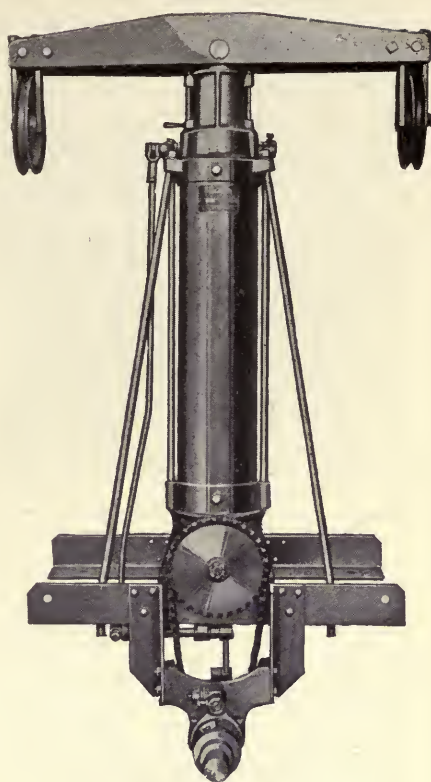
Horizontal and Vertical Mechanical Dump-Truck Hoists

Since more than three-quarters of the inquiries for truck hoists are now for the horizontal variety, according to the officials of the Van Dorn Iron Works Co., Cleveland, Ohio, a brief description of this type of hoist will be of interest. The hoist itself is bolted to the frame beneath the body by a three-point suspension to allow for all weave and twist of the truck. An ample-size roller chain connects the power take-off of the motor to the hoist. The connection between the hoist and the body is made by a link and lift arm to give the highest dumping angle and to allow a compact "jack-knife" folding of the arm under the frame when the body is in its lowered position. The cut-away view shows the mechanical arrangement. The arm and link arrangement also forms a positive rigid connection at all times, regardless of the dumping angle of the body. There is no danger of the body's becoming overbalanced and tilting suddenly under the shifting of the load.

The hoist is controlled by a hand lever reached from the driver's seat, and can be stopped and lowered or locked rigidly at any dumping angle. It stops automatically at a dumping angle of 45 degrees, and the truck can be driving away while the body is lowering, as the hoist stops automatically as the body settles to its bed. This hoist is built in both light-duty and heavy-duty sizes.

A vertical dump-truck hoist operated on the screw-jack principle is also manufactured by the Van Dorn Iron Works Company. This hoist, as well as the horizontal type, is said to speed up road dumping and will stand the racking strain and rough usage of dump-truck service with a minimum of operating and upkeep expense. It is built in two sizes—the light-duty hoist for 1- to 3-ton trucks, and the heavy-duty for 3½- to 7½-ton trucks.

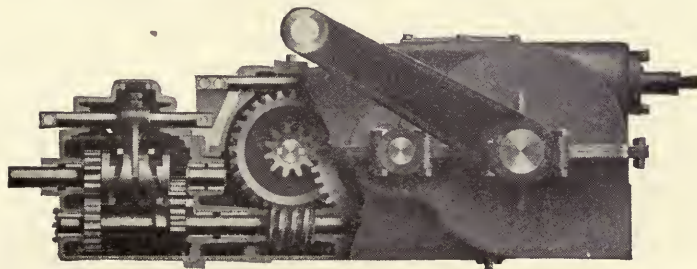
This hoist is said to easily dump a 6-ton load



A VERTICAL HOIST FOR MOTOR DUMP-TRUCKS

in 20 seconds. The truck can be driving away while the body is lowered. The body can be stopped and held at any angle up to 45 degrees without danger of lowering the body as the load is being dumped or scattered. Gravity plays no part in the operation of lowering the body. The body can be lowered only by the power which raises it.

The connection between the hoist and the truck body is made by 5/8-inch steel cable affixed to the truck body and rolling over the sheave wheels of the hoist and fastened to an eye-bolt at the base of the hoist. The hoist itself is driven from the power take-off of the truck, which is connected with the bevel gears of the hoist. When a convenient control lever, reached from the driver's seat, is pushed to the rear, it meshes a steel jaw clutch fitted to the screw-shaft, with the upper beveled gear. This rotates the jack-screw in the proper direction to raise a large bronze nut which is threaded to the jack-screw and fitted to the lower part of the plunger. When the plunger is driven up, the total load is supported by



A HORIZONTAL HOIST FOR MOTOR DUMP-TRUCK



YOU can turn it on a dime." This is the way one operator describes the flexibility of the Ideal Power Triples Mower. Sharp angles are cut without hesitation; obstructions are avoided with inch-accuracy; gravel drives cause no trouble because the cutting units can be raised without leaving the seat or stopping the mower. These features account for its immense capacity.

And don't forget the "Bulldog" cutting units. They are made to endure week after week of the punishing service that all-too-often makes a wreck of ordinary equipment.

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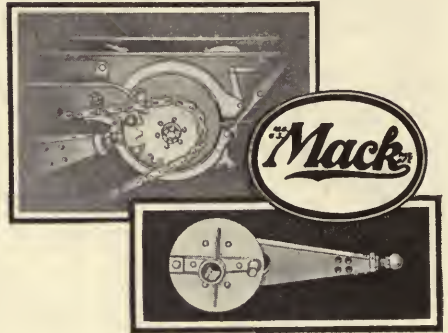
IDEAL Power Lawn Mowers

(77)



Ideal Junior and 30-inch models have capacities of 3 to 5 acres and 5 to 8 acres daily.

Exclusive Features Nos. 16 & 17



The Front Sprocket The Pressed Steel Radius Rod

WHEN the International Motor Company developed a drop-forged front sprocket, case-hardened its teeth and used it in conjunction with hardened chain rollers, the present-day efficient Mack chain drive was made possible. This drive not only performs efficiently and economically under normal going but has no equal when operating under adverse load and road conditions.

The Mack pressed steel radius rod is made in channel section and is lighter for a given strength and more flexible than common cast rods. This construction assures unvarying chain centers under all driving conditions. The large ball joint at its front end permits a single connection that adjusts itself to chassis movements. It is held by a socket that forms part of a drop-forging bolted to the chassis frame independent of the jackshaft.

INTERNATIONAL MOTOR COMPANY
25 Broadway New York City

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Send for illustrated and descriptive literature on all exclusive features.

PERFORMANCE COUNTS

the heavy screw-shaft, which rests upon an ample-sized thrust bearing.

To lower the plunger, the hand lever is pulled forward. The clutch meshes with the lower beveled gear, and the jack-screw is rotated in a direction to pull down the bronze nut attached to the plunger.

Boston Office of Gamewell Moved

The Boston office of the Gamewell Fire Alarm Telegraph Company, Newton Upper Falls, Mass., which was formerly at 200 Devonshire Street, has been moved to 1022 Commonwealth Avenue, and a service station established. A repair man will be kept on hand to make all minor repairs promptly and a stock of register paper and battery supplies will be carried to care for emergencies. A working exhibition of modern apparatus will be installed.

Two reasons have contributed to the establishment of this new office—it will enable the Gamewell Company to give better service to New England customers, and in the new service station plenty of space will be provided in the rear so that chiefs and superintendents can come in and leave their cars as long as they please. A similar service station will be established in the near future in San Francisco, and space has already been provided at 939 Larkin Street.

Snow-Plow Attachments for Best and Holt Tractors

Two new special snow-plows for track-laying tractors have recently been developed by the La Plant-Choate Manufacturing Company, Cedar Rapids, Iowa. These plows are especially adapted for use with Best and Holt tractors.

The small size is designed for use with a 5-ton tractor and consists of a 10-foot blade with a mold-board so curved and tilted that the top is practically on a vertical line with the cutting edge, which permits the snow to roll to the back of the mold-board and prevents a head of snow which would be caused if the mold-board did not have the correct shape.

The plow proper is attached to a main frame which surrounds the tractor. The frame is pushed from the rear draw-bar of the tractor, and is guided in front by special guides which push against the side frame of the tractor. The blade is pivoted in the center on the swing frame, and can be set perfectly straight or at a 5- or 40-degree angle and can be swung to either side so that snow can be thrown to one side or the other.

The blade plow is raised or lowered by means of a worm-gear windlass operated by a hand wheel in the tractor cab, making the outfit a one-man job. The front frame is supported by two wide-curved steel runners. The drive of the plow is from the rear draw-bar through the main frame and thence to the swing frame. The point of contact on the main frame is toward the rear just past the center line of the tractor. This is done to prevent side draft on the tractor.

The shoes are placed under the front only, and the pivot point is placed back as close to the line of the radiator as possible, to enable the tractor driver to properly steer the tractor without difficulty. In addition, it shortens up the entire length of the outfit.

The blade plow is used for city work, for industrial plants and where the snow is not too deep. For heavy, deep drifted snow, such as is found on county and state highways, the La Plant-Choate Company has developed a large V-type plow which is called the "Drift Breaker." The plow has a special mold-board shape which gets a rolling action on the snow, rolling it toward the back and picking it up. The plow is 12 feet wide at the rear of the V.

The main V is attached to a swing frame which is secured to the main frame by means of two pivotal points, and the front end of the V is supported by a hydraulic jack which is operated from an oil pump mounted at the rear of the tractor. The plow can be raised or lowered by means of a lever operated in the cab, enabling the operator to raise the plow 20 inches in seven seconds, so that it can be elevated quickly to cross a railroad track or other obstructions or be made ready for transportation to new points where snow is to be handled. The hydraulic lifting device is a novel feature which works very satisfactorily. Zero oil is used in the hydraulic pump to prevent freezing in the coldest weather. The hy-



BLADE-TYPE PLOW FOR 5-TON TRACTORS

Your City Needs This Lawn Beautifier

You men have a responsibility in keeping municipal lawns and greens beautiful and healthy, and in seeing that they are maintained in the most economical way. Emphatically that is what you may expect of a Jacobsen 4-Acre Power Lawn Mower. It cuts fully four acres a day with one man and a gallon of gas—a saving of 50 to 75 percent in upkeep and more beautiful lawns because it does the work better and leaves no excuse for neglect.

The Jacobsen "4-Acre" Power Mower

Guaranteed to do more and better work at less cost and to outlast any other walking power mower. Standard automobile type differential makes easy steering about trees, flower beds and shrubbery. No other power mower will do as neat close-up work. It cuts on a 30 degree incline—does beautiful terrace work. The knives are sharpened by its own power without removing reel. It is simple, compact and sturdy. Anyone can handle it without being a mechanic. Pays for itself in a short time.

A Time-Tested Product

Years of unequaled performance on private estates, parks, cemeteries, golf courses, from coast to coast have proven the sterling quality of this mower. It wins everywhere in competition with all makes.

Our Special Power Putting-Green Mower is a favorite on Municipal Golf Links.



**Jacobsen
4-Acre
Power Lawn
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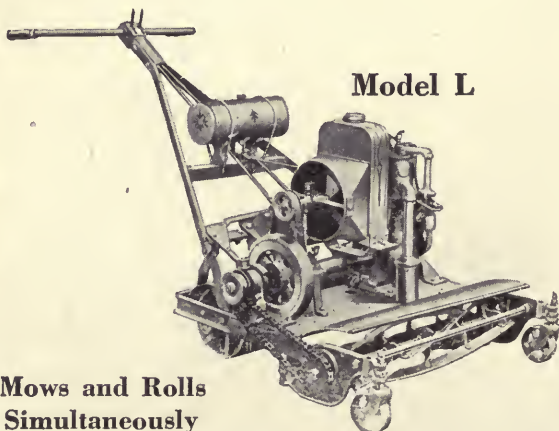
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Mows and Rolls Six Acres a Day!



Model L

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Simultaneously**

The Coldwell Model "L" through its ease of operation, flexibility and proof against breakdown gives the operator no excuse for loafing on the job. He can't blame it on the Coldwell.

Thus, the amount of work finished depends entirely upon the man behind the handle. Coldwell Mowers will answer his every demand.

Trims close around trees and shrubbery, eliminating costly and time-consuming hand work. Cutter knives and traction roller separately controlled.

Catalog?

**COLDWELL LAWN MOWER CO.
NEWBURGH, N.Y., U.S.A.**

Hand, Horse, Motor and Gang Mowers.



V-TYPE PLOW FOR 10-TON TRACTORS

draulic feature does away with one extra man on the crew, enabling the outfit to be manned by the tractor driver and one helper. All the helper has to do is to elevate the side wings, which are 12 feet long and 3 feet high and are fitted with cutting edged blades of steel.

The wings can be raised in front at the pivotal point 3 feet and at the rear about 8 or 9 feet. These wings are so supported that they can be swung in or out by means of adjustable guides or braces and can be folded in close to the tractor, allowing traffic to pass, or where snow is too deep to have the wings extended. The wings can be adjusted at angles of 15 to 40 degrees, so that the sides of banks can be shaved off, thereby preventing them from drifting.

The plow is heavily reinforced and the heavy drawbar at the rear is so constructed that in deep snow-fall under extreme conditions two 10-ton tractors can be used to double head and push the plow. The plow itself is a separate unit from the tractor, and whenever desired it can be backed out of the main plow frame by moving two king-bolts. The main frame is held in position against side motion by guides bolted to the front end of the swing frame on each side of the tractor, so that when the tractor turns either to the right or the left, the guides push against the frame of the plow, making it adjust itself to the new direction.

In attaching either of these plows to a standard track-laying tractor, no alterations are necessary to the tractor. This simple method of attaching means that the tractors can be disconnected and used for other work without loss of time.

Holt Moves New York Office

The Holt Manufacturing Company, Inc., Peoria, Ill., has announced the removal of its New York office and Mount Vernon service station to 250 West 54th Street, New York City. The export and eastern sales offices and service department with permanent tractor exhibits and complete parts stocks henceforth will be located at the new address.

New Bridge Across the White River at Hazleton, Ind.

THE opening of the new \$275,000 bridge across the White River at Hazleton, Ind., was marked by a huge celebration at which good roads representatives, chambers of commerce, automobile clubs and chief executives and high officials of half a dozen states participated.

The Hazleton Bridge was built by the Stein Construction Company of Milwaukee, Wis., which started work in September, 1921. The bridge with its approaches is nearly three miles long and contains eight steel spans and twenty-one concrete spans. Four of the steel spans are each 198 feet long, while four are 80 feet long. The bridge proper is 2002.5 feet, the north approach 7,448 feet, and the south approach 3,800 feet. The roadway is 20 feet wide and the structure will safely carry 20-ton

vehicles.

On the south side the first three foundations are carried to solid rock. The rock stratum then drops; therefore piling was then used. The bottom of the main river foundations where the rock stratum dips is 22 feet below low water, with a maximum length of 40 feet of piling below this point. The bridge is without a draw, being 38½ feet above low water.

Approximately 1,500,000 pounds of structural steel, 350,000 pounds of reinforcing steel in the concrete, 6,200 cubic yards of concrete, and 13,000 linear feet of timber piling were used in its construction. Slightly in excess of 90,000 cubic yards of earth were used in the north embankment. It is estimated that 60 per cent of the cost is for work below the water-line.



The King of the Black Tops,
says:—

"It is easy to look like the real thing, but it takes quality all through to equal it; regardless of whether you are talking of precious metal, fine woods or good roads.

Warrenite-Bitulithic Pavement

is easy to copy in appearance, but its through and through goodness defies imitation. Half a century of experience has produced an excellence of materials and making which as yet are unequalled."

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does a better job than hand labor at half the cost. Contractors declare it pays for itself the first mile.

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Vol. XXX
No. 2

The American City Magazine

FEBRUARY
1924

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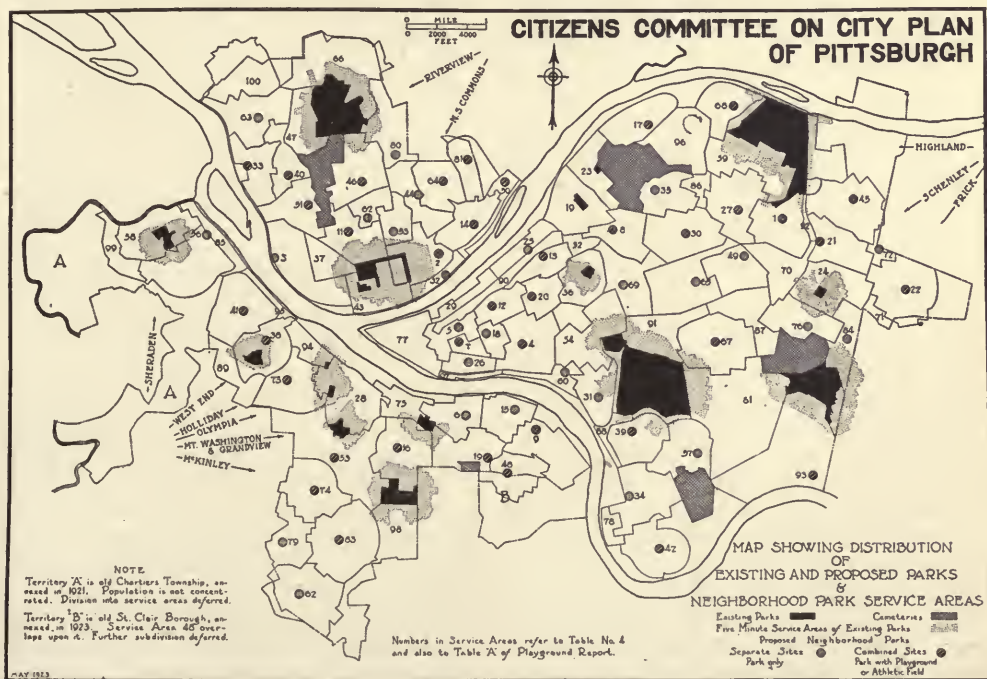
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A Map with a Lesson for Every Growing City

EVERY circular dot in the accompanying map shows the site of a proposed neighborhood park or playground in the city of Pittsburgh, Pa. If acquired by the city, as recommended by the Citizens Committee on City Plan, Pittsburgh will pay a big price for recreation areas which might have been secured at almost nominal cost in the city's early days. And, meanwhile, a large percentage of Pittsburgh's population are deprived of convenient opportunities for outdoor play. In this situation, Pittsburgh is, of course, by no means

alone among the large cities of America; but with the present understanding of the need for neighborhood parks and playgrounds, there will be scant justification for any smaller city finding itself in Pittsburgh's plight when it reaches Pittsburgh's size. In that city to-day, some 340,000 persons, or 58 per cent of the population, are more than 15 minutes' walk from any existing park having an area greater than five acres; and the service to these persons by smaller parks is almost negligible.

In its recent report on "Parks," from



which this map is reproduced, the Citizens Committee on City Plan of Pittsburgh has an excellent statement of the social and economic value of recreation. To quote in part:

"Recreation is an essential human need. It is vital both to the individual and to the community as a whole. When it is wholesome, recreation encourages contentment, develops health and increases the capabilities and efficiency of individuals. The harder and more continuously a man works, the more uninteresting or monotonous his job, the greater is his need for relaxation and change of environment and occupation. The less a family has of sunlight, fresh air, privacy, and attractiveness in the home, the greater is its need for change of scene and for wholesome interests to divert and re-create the mind.

"That citizens, generally, recognize their need for diversion and are willing to pay for it, is proved by the popularity and financial success of commercial recreation and amusement enterprises."

"Recreation is of many kinds. It may be wholesome or unwholesome. It may be physical activity, mental activity, the enjoyment of beauty, amusement only, or merely rest and relaxation. It may mean these and many other things. It may be found indoors—in museums,

galleries, concert halls, theaters, recreation and amusement buildings, and the like. It may be found out of doors—in the woods or open country, upon the water, and within open spaces which the community may set aside for the purpose.

"Human beings, as well as plants, thrive out of doors. Open spaces are the city's lungs. They are breathing places. They may be used as playgrounds for the children, or as athletic centers for both children and adults. They may consist of large parks and boulevards, formal or informal city "squares" and neighborhood parks, or water recreation areas. As the city grows, the need to provide such open spaces becomes more frequent and urgent. This is a fundamental issue, and no seeming expediency or false idea of practicality should prevent the facing of the issue squarely.

"In the past, Pittsburgh employers have been handicapped, because workers were attracted to other cities which offered more and better recreation facilities than this city could offer. If the aggregate time annually available in this city for recreation were expended wholesomely and healthfully, even if very great expenditures were required to provide facilities for that purpose, there would be an incalculable economic return. The investment would be an investment in public health, contentment and efficiency, and in better citizenship."

Total Debt and Revenues of Governmental Units

THE Department of Commerce made available last month a preliminary summary of the gross debt of the National Government, of the 48 states and the District of Columbia, and of all cities, towns, villages, school districts, townships, drainage districts, park districts, and all other civil divisions having the power to incur debt. The totals are as follows:

	1922	1912	Per Cent of Increase
State governments	\$1,162,648,000	\$422,796,000	175
Counties	1,366,636,000	371,528,000	268
Cities and all other civil divisions ..	7,731,658,000	3,104,426,000	149
Total . . .	\$10,260,942,000	\$3,898,750,000	163
National Government ..	22,525,773,000	2,916,205,000	672
Grand total.	\$32,786,715,000	\$6,814,955,000	381

As an offset to the above gross debt of \$32,786,715,000, there are sinking fund and other assets held for the retirement of such debt in 1922, of \$1,934,899,000, leaving a net debt of \$30,851,816,000, or \$283.76 per capita. The indebtedness of other countries to the United States November 15, 1923, was \$11,800,010,245.

The gross debt as reported represents all of the public indebtedness, including funded or fixed debt (long term and serial bonds), special assessment bonds, temporary loans, outstanding warrants, and other debt of every character. Of the total public debt of 1922, the National Government represented 68.7 per cent, the state governments 3.5 per cent, the counties 4.2 per cent,

and all other civil divisions 23.6 per cent; in 1912 the National Government represented 42.8 per cent of the total public debt, the state governments 6.2 per cent, the counties 5.5 per cent, and all other civil divisions 45.6 per cent.

There was also issued last month by the Department of Commerce a statement in regard to the specified revenues of the National Government for 1923, and of the states and their civil divisions for 1922. The grand total of these revenues is \$7,433,081,000, or an average of \$68.37 for each person. Of this total, \$3,204,133,000 represents the revenues of the National Government, consisting of customs, \$562,189,000; Internal Revenue (1) income and profit tax, \$1,691,090,000, and (2) miscellaneous taxes, \$935,699,000; tax on circulation of national banks, \$4,304,000; and Federal Reserve franchise tax, \$10,851,000.

The total revenues of other political units are as follows:

State governments	\$867,468,000
Counties	742,331,000
Incorporated places	1,627,329,000
Townships	151,818,000
School districts	738,433,000
All other civil divisions.....	102,069,000

The grand total for these civil divisions is \$4,228,948,000, or an average of \$38.90 for each person. Of this total, \$3,329,380,000, or 78.7 per cent, comes from general property taxes. Special taxes, including inheritance, income, etc., contribute \$258,034,000; poll taxes, \$29,190,000; licenses and permits, \$408,597,000; and special assessments, \$203,747,000.

Public Health Helps for Municipal Officials---Part I

By Carl E. McCombs, M. D.

National Institute of Public Administration

PERSONAL hygiene is a subject about which most people are pretty well informed nowadays and perhaps generally competent to express sound opinions, thanks to the broadcasting of health advice and instruction by public and private agencies for health promotion. But the administration of public health is a matter that requires the adoption of standards for which individual opinion does not offer a satisfactory basis. For guidance in matters of public health policy a city should depend upon the counsel of specialists in health administration. Its efforts to obtain public health efficiency will be productive in proportion to the measure of adoption of standards which such specialists have approved. The aim of this article is to suggest what certain of these standards are, how they may be used for the appraisal of municipal health practise, and how applied for the improvement of municipal health service.

Public health administration has the same primary objective in all cities, namely, the prevention of disease. In its essentials disease prevention connotes provision in the administrative program for certain well-defined activities or groups of activities commonly called health functions. Although there is no universal agreement as to the limits of health administrative responsibility, a simple and inclusive classification of health functions is shown in the accompanying list.

For all of the functions in this list health departments should be considered as having administrative responsibility, although in many cities those activities having to do particularly with the health of school children have for local reasons of expediency been turned over to educational authorities. It is, however, the consensus

of opinion among health executives that school health work is more satisfactorily carried on by health departments as merely one phase of the general child hygiene program which begins in the prenatal period and continues on through school life and into employment.

It may perhaps be expedient to charge municipal health departments with the administration of other activities that do not have the primary objective of disease prevention, but it should be clearly understood

that such activities as the collection and disposal of garbage and refuse, street cleaning and plumbing inspection are not properly health administrative functions. It is the business of the health department to see that garbage and refuse are so disposed of as not to be a health nuisance and that such plumbing devices as are installed are adequate and so used as to carry away infectious matter safely, but there its responsibility should end. It is because of this difficulty of drawing the line clearly between what is actually the health department's administrative responsibility and what common opinion holds should be its

Classifications of Municipal Health Department Functions

(a) Prevention of communicable diseases—their registration, investigation, supervision and control

(b) Child hygiene—the supervision and protection of the health of children from the prenatal period on through school and into employment.

(c) Food sanitation—the inspection of foods and beverages, including milk, to prevent their contamination with disease-producing organisms or agents

(d) General sanitation—the inspection of premises and the correction of conditions which may be or may become contributory to the spread of disease

(e) Keeping of vital statistics—the “bookkeeping of health,” which comprises mainly the registration compilation and analysis of statistics of birth, marriage and death

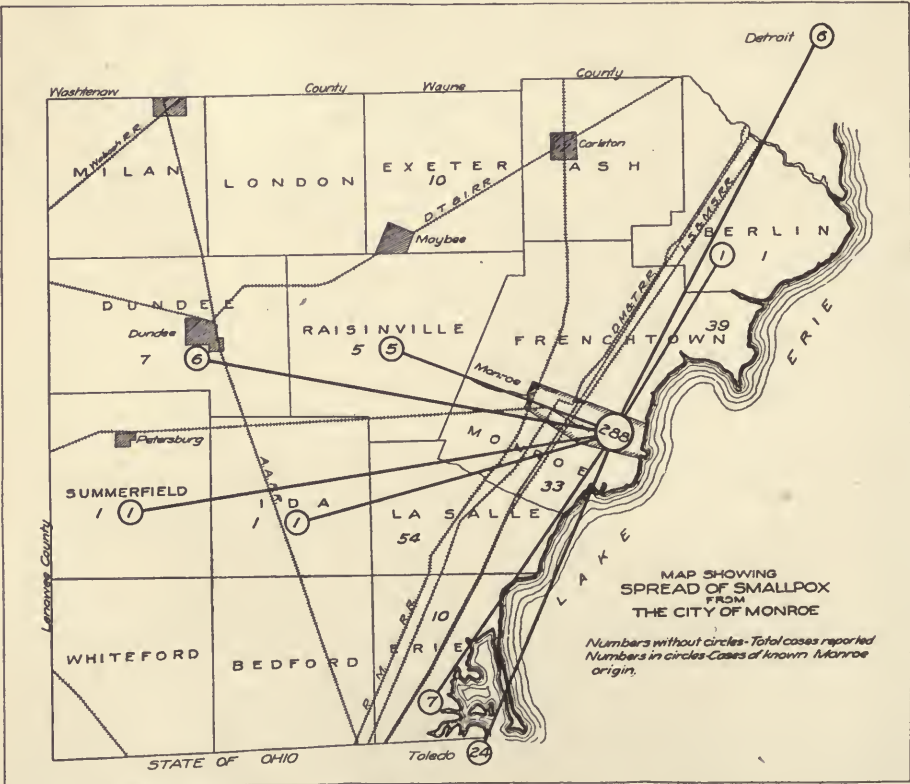
responsibility that we have health departments all over the country saddled with work that is relatively unproductive in community health. Mandatory laws have been passed putting upon health departments the duty of enforcing regulations supposed to be in the interest of public health but actually of little practical value in disease prevention. In many cities health departments are spending more money for relatively health-valueless services than for work which has a high measurable value in the prevention of sickness and death. It is not at all uncommon to find cities obliged to spend more to enforce their elaborate plumbing codes than to enforce their regulations for the control of contagious diseases; more to prevent accumulations of rubbish and ashes in back-yards and alleys than to prevent infant deaths; more to inspect garbage cans than to inspect school children to prevent disease and physical defect.

This brings up the whole question of relative values in health service, and its re-

lation to health expenditure. The role of the various activities of a health department in disease prevention can be measured fairly accurately in the light of the modern knowledge of how disease is spread and what its consequences are. Different authorities may give slightly different weights to the various phases of health work, but in general they agree on the relative standing of the major activities in the disease-prevention program. A typical example of a table of relative values is that prepared by Franz Schneider, Jr., a sanitarian formerly of the Russell Sage Foundation in New York City.^{(1)*} Mr. Schneider rates the values of the various disease prevention activities of a health department as follows:

Control of communicable diseases	
Tuberculosis	12.1
Veneral diseases	6.6
All others	25.3
Infant hygiene	20.3
Privy and well sanitation.....	3.5
Milk control	2.7
Fly and mosquito suppression.....	2.4

*The figures found throughout the text refer to the list of selected references at the end of the article.



Courtesy of American Journal of Public Health

MAP SHOWING SPREAD OF SMALLPOX FROM THE CITY OF MONROE

Food sanitation	0.1
Inspection of school children.....	7.0
Vital statistics	5.0
Education	5.0
Dispensary and clinics.....	5.0
Laboratory	5.0
Total	100.0

It would of course be impracticable to attempt to distribute the health budgets of all cities strictly according to such a schedule as Mr. Schneider sets up. Under certain conditions milk control might be an extremely important factor in the prevention and control of communicable diseases; as, for example, typhoid fever, which is frequently milk-borne. Milk control might also be an essential feature of infant hygiene work. In certain communities where primitive methods of disposal of human excreta still exist, privy and well sanitation might easily become a health service of the highest health value in the prevention of water-borne diseases or diseases like hookworm which are spread through soil pollution. One of the greatest health menaces in many communities, particularly in the rural South, is soil pollution, the result of improper disposal of excreta. So we must accept such tables of relative value with certain reservations when it comes to determining precisely how the health budget shall be spent.

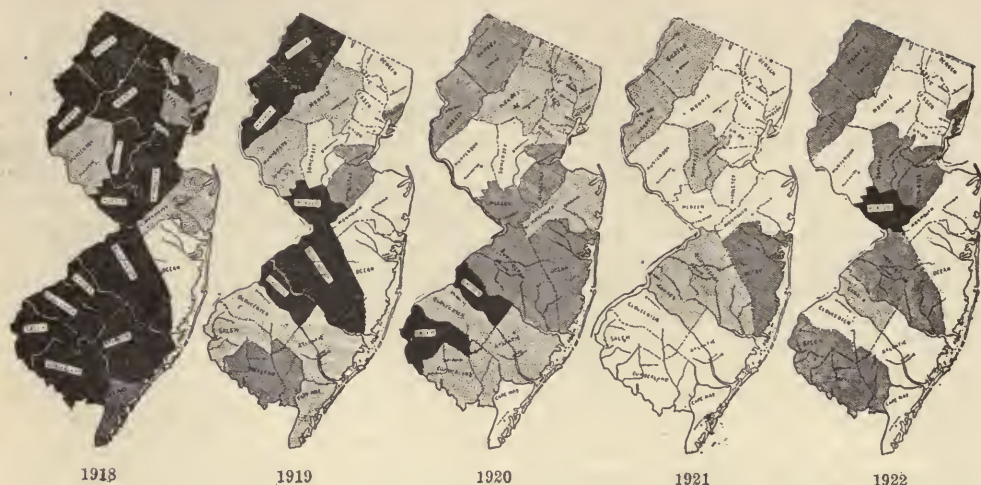
It is interesting to compare Mr. Schneider's table of relative values with the distribution of health department expenditures as set forth in the recently published First Report of the Committee on Municipal Health Department Practice of the American Public Health Association.^{(2)*} This report tabulates for 72 cities the distribution of health department expenditures for "strictly defined health service" (exclusive of contagious disease hospitals) as follows:

Character of Service	Per Cent of Total Expenditure for Health Work
Administration	11.3
Communicable disease control (general) ..	15.4
Tuberculosis	3.3
*See also special report of same committee on Expenditures of Health Departments ⁽²⁾ .	
Veneral diseases	2.5
Infant welfare	7.7
School health supervision	8.4
Public Health nursing	3.4
Laboratories	7.0
Food inspection	14.2
Sanitary inspection	19.4
Vital statistics	8.1
Miscellaneous	4.4
Total	100.0

It will be seen from such comparison

that many cities are apparently spending a major part of their budgets for relatively health-valueless service. For example, we find that more is spent for food inspection—much of which work, other than milk and meat inspection, has a relatively low health value—than for infant welfare, or school hygiene, each of which has a high value. Almost as much is spent by these 72 cities for sanitary inspection as for the control of all communicable diseases, including both tuberculosis and venereal diseases, which has a far greater health significance to the community. Obviously, there is need for readjustment of health expenditures in many of our cities, to the end that more health value may be purchased per dollar expenditure. The intelligent use of a table of relative values of health service, such as that prepared by Mr. Schneider, will go far toward insuring a properly balanced expenditure of health funds, and municipal officials, by comparing their own health budget distribution with a table of this kind, will perhaps find the clue to uneconomic or wasteful expenditure.

Efficient expenditure for health service in any community may be said to depend upon three principles. The first is that no matter how much money is made available, it shall be budgeted for the various activities so that the amount available for each activity shall be in direct proportion to the health productiveness of the activity measured in terms of disease prevention. The second is that the program of disease prevention shall not be based upon the health tradition or theory of a previous generation but upon the scientific principles which modern health research has established. The third is that the budget shall be sufficient to put such a rational program into effect and carry it out to a logical conclusion. There ought to be more money available for public health work in the majority of our cities, but until health funds are used to buy health values instead of health labels, and until a program of disease prevention has been adopted that conforms in essentials at least to the best modern practise, those who hold the strings of the public purse will not be readily convinced of the necessity for greater expenditure. The problem of increasing health department expenditures will not be found nearly so difficult when it is possible to



FIVE YEARS' PROGRESS IN REDUCING THE INFANT DEATH-RATE—DEATHS UNDER ONE YEAR PER THOUSAND LIVE BIRTHS IN NEW JERSEY

Key: Black indicates more than 100 deaths per 1,000; cross-hatch, from 90 to 99; dotted, from 80 to 99; white, less than 80 per 1,000

demonstrate to the appropriating body that such funds as have been granted have been wisely spent and according to a program that has the sanction of the most competent health authorities.

Prevention of Communicable Diseases

Let us consider first the prevention of communicable diseases, which stands at the very top of our table of health-valuable activities. A special committee of the American Public Health Association, which represents the great majority of health specialists of the country, has prepared a report on the Control of Communicable Diseases⁽⁴⁾ which outlines in detail the procedure to be followed to secure best results. All that is necessary for local health authorities to do is to accept these standard rules, incorporate them in their health codes, and then secure sufficient funds to make them effective. But in spite of the fact that these standard rules provide an authoritative, easily applicable program of disease prevention, relatively few cities have put them wholly into effect. Terminal fumigation of premises following contagious diseases is still practised in many cities, although its replacement by other methods of destruction of infectious material is conceded to be less expensive and more productive. The adoption of the Schick test to determine the immunity of children to diphtheria and the immuniza-

tion of all those susceptible to the disease is as certain a method of prevention of this disease as vaccination for smallpox, yet only few cities have made a determined effort to prevent diphtheria by this easily applicable, inexpensive and positive method. While opportunities for the spread of communicable diseases have increased tremendously in the past twenty years through all the various channels of communication between individuals and communities, the methods of preventing disease in many communities have improved but little in the same period.

Child Hygiene

The infant mortality rate of a community is a good index to health department efficiency. Given an adequate program of baby-saving and sufficient funds to carry it out, any community can produce striking results. In our table of relative values it ranks next to control of communicable diseases, but in our table of municipal health expenditures it falls below expenditures for other far less essential services. The recent report on Infant Mortality in the United States by the American Child Hygiene Association shows that the infant mortality rates of 573 American cities vary from 24 per 1,000 births in East Hartford, Conn., to 255 per 1,000 births in Lackawanna, N. Y.⁽⁵⁾ There are, of course, many factors to be considered in

determining the reasons for high or low infant death-rates, but an infant death-rate above 100 per 1,000 births is certainly to be regarded as presumptive evidence of inefficient health service. The methods of preventing infant deaths are so well established that no community need consider that it is conducting an experiment when it decides to adopt them. Briefly stated, a program of baby-saving should include:

- (a) Prenatal instruction of mothers by trained nurses and physicians, in their homes and in public clinics
- (b) Supervision of the obstetrical practise of midwives and physicians
- (c) Provision of proper facilities for the obstetrical care of mothers in hospitals or homes, and at public expense when necessary
- (d) Prompt and complete registration of births and infant deaths
- (e) Investigation of all cases of infant death, including still births
- (f) Visitation of mothers and their new-born infants by trained nurses, in homes or in special clinics
- (g) Inspection and supervision of infants' boarding homes, day nurseries and other places where infants may be cared for
- (h) Thorough education of the public in all matters relating to infant health

There is so much valuable reference material on this subject that it is difficult to select a single document. For an outline of administrative procedure that has demonstrated its efficiency, the reader is referred to the reports of the Bureau of Child Hygiene of the New York City Health Department and the Bureau of Child Hygiene of the New Jersey State Health Department.

Prevention of infant mortality is simply one phase of the broad health function which we have called child hygiene. Child

hygiene as a health department responsibility includes not only the carrying on of all of the baby-saving activities above outlined, but also a program of child health protection and promotion that will maintain contact with children and their homes in infancy, through the pre-school-age period, through school life, and, finally, in employment. Of these periods in child life, the school years offer the greatest opportunity for effective health education, not only of the child himself, but of others in the home from which he comes.

That many cities have failed to take full advantage of this great opportunity is clear from the recent report on Health Service in City Schools by the Joint Committee on

WHAT IS THE TYPE OF YOUR COMMUNITY?



GET TOGETHER AND ESTABLISH A PUERICULTURE CENTER

DEPARTMENT OF THE INTERIOR
OFFICE OF THE PUBLIC WELFARE COMMISSIONER
Manila, P. I.

A Child Welfare Series ②

CHILD WELFARE CENTERS, CALLED PUERICULTURE CENTERS IN MANILA, P. I., ARE BEING ADVOCATED BY THE PUBLIC WELFARE COMMISSIONER

Health Problems in Education of the National Education Association and the American Medical Association.⁽¹⁾ There is the widest variation among cities in standards of service, in expenditure, and in benefits obtained. Too often we find cities spending large sums of money to detect physical and mental defects of children, but because they have not adequate facilities for treatment and correction of these defects, their money is largely wasted. The report above mentioned shows that of 302 cities 115 had inadequate facilities and 25 no facilities for the treatment of visual defects; 116 inadequate facilities and 21 no facilities for the treatment of tonsils and adenoids; 143 inadequate facilities and 23 no facilities for the correction of dental defects. In short, almost half of the cities were not so equipped as to take best advantage of school health examinations. Further interesting facts regarding school health administration will be found in a special report on School Health Supervision of the Committee on Municipal Health Department Practice of the American Public Health Association previously referred to.⁽²⁾

Where responsibility for the administration of school health work should be lodged, whether in the local health or the education department, is a moot question over which there has been much controversy, but that need not concern us here. The important thing for city officials to know is whether or not their city has an adequate program of school health service and whether or not all forces of both health and educational departments are being properly utilized to make that service productive in community health. Briefly summarized, a school health program should include:

1. Adequate sanitary supervision of the school plant, its equipment and environment
2. Daily inspection of children by competent persons to detect and exclude communicable diseases
3. Physical and mental examinations of all children at school entrance and periodically thereafter
4. Correction of physical and mental defects at public expense if necessary
5. Health education and physical training adapted to child needs
6. Protection of children entering employment so that employment may be as far as possible suited to their physical and mental equipment

How and to what extent the details of such a program should be carried out is a question for each community to determine. There are, however, certain principles which should govern procedure in every community, and these principles have been embodied in the report of the committee on School Health Program of the American Public Health Association.⁽³⁾ For an excellent summary of the essentials of school health supervision the reader is referred also to School Health Supervision Based Upon Age and Sex Incidence of Physical Defects, by S. Josephine Baker, formerly Director of the Bureau of Child Hygiene of the New York City Health Department.⁽⁴⁾

- (1) Relative Values in Public Health Work, by Franz Schneider, Jr.; American Journal of Public Health, September, 1919
How to Determine Relative Values in Sanitation, by George C. Whipple; THE AMERICAN CITY, May, 1914
Relative Values in Public Health Engineering, by M. N. Baker, Associate Editor, Engineering News-Record; apply to Engineering News-Record, 10th Avenue and 36th Street, New York, N. Y.
- (2) First Report of the Committee on Municipal Health Department Practice of the American Health Association; Reprint of American Public Health Association, 370 Seventh Avenue, New York City
- (3) Expenditures of Health Departments, the Report of the Committee on Municipal Health Department Practice of the American Public Health Association; American Journal of Public Health, June, 1923
- (4) The Control of Communicable Diseases, the Report of American Public Health Association Committee on Standard Regulations; Reprint No. 436 of Public Health Reports, Government Printing Office, Washington, D. C.
- (5) Statistical Report on Infant Mortality in 573 Cities of the United States; American Child Hygiene Association, 17th and T Streets, N. W., Washington, D. C.
- (6) Health Service in City Schools; Report of the Joint Committee on Health Problems in Education of the National Education Association, and the American Medical Association. Prepared by Dr. Thomas D. Wood, Chairman, 525 West 120th Street, New York City
- (7) Report of School Health Supervision of the Committee on Municipal Health Department Practice of the American Public Health Association; American Journal of Public Health, April, 1923
- (8) Report of the Committee on School Health Program of the American Public Health Association; Reprint of the American Public Health Association, 370 Seventh Avenue, New York City
- (9) School Health Supervision, Based Upon Age and Sex Incidence of Physical Defects, by S. Josephine Baker, M. D., Director of the Bureau of Child Hygiene, New York City Health Department; American Journal of Public Health, June, 1922

NOTE.—Since this article was written references 2, 3 and 7 above have been published together with other valuable articles as Public Health Bulletin No. 136, Report of the Committee on Municipal Health Department Practice of the American Public Health Association in cooperation with the United States Public Health Service. This document may be obtained for 50 cents from the Government Printing Office at Washington.

Selection of Pumping Equipment for Station Economy

By Frank A. Mazzur

Boston, Mass.

THE two points of paramount importance in securing additional pumping equipment are dependability and operating costs, and in a pumping-plant furnishing the water-supply for a community dependability is by far the greater of these two points. In making the comparisons of the various types of apparatus, I have based the figures on units of about 3,000,000 gallons capacity in 24 hours, as the majority of pumping-plants are of this size or smaller.

Let us consider the extension of a plant equipped with two direct-acting compound pumps, one of which is to be replaced with a pump of somewhat greater capacity. As the direct-acting pumps, even when new, have a very poor duty compared with what we look for at the present time, the new unit would naturally be of a different type. In the event of the available space being able to accommodate a crank and fly-wheel engine without any great alterations in the building, this type of engine should undoubtedly receive serious consideration. The crank and fly-wheel pumping-engine is without question the most economical in the use of steam, a unit of this size being able to deliver about 124,000,000 foot-pounds per thousand pounds of steam under the ordinary steam conditions found in existing pumping-stations. They also

have an excellent record for dependability and low cost of up-keep. Their price, however, is high compared to other types of pumping equipment, but even with its high cost this type of steam-driven pump is a favorite where the maximum steam economy is the main consideration.

An Article Based on Practise Rather Than on Theory

In this article the writer discusses the problems met when a water-works plant needs to increase its pumping facilities either because of the obsolescence of its present equipment or because of need of additional pumping capacity. He does not consider the construction of a new plant. Throughout the paper good boiler equipment is assumed, and the plant discussed is one of about 3,000,000 gallons daily capacity. The figures used are based on actual installation and operation costs. Similar installations in other plants would probably vary somewhat from the figures given, and, therefore, all of these costs are to be taken as approximate. The chief value of the discussion, however, is to bring out the salient points and emphasize the extreme care with which the problem should be approached.

Each and every installation is a problem by itself, and unless it is viewed from every angle and every factor is carefully weighed, it is very easy to make a selection that will be disappointing in the results obtained. Mistakes in engineering are usually costly, and it is only by careful diagnosis that they may be avoided and satisfactory results assured.

It may be, however, that to install a crank and fly-wheel pumping-engine would entail an extensive addition to the buildings, the cost of which, added to the high cost of the pumping-engine, would bring the fixed charges on the investment up to a point where the total yearly cost would be greater than if a unit of different type and poorer duty but of much lower cost were installed.

Other Types of Drive with Centrifugal Pumps

Turbine Drive.—

The turbine-driven centrifugal pump has the advantage of low first cost and very small space requirements compared with the crank and fly-wheel pumping-engine. The duty, however, is by no means as good, but this is very often more than offset by its lower cost. Under the same steam conditions, which will give a duty of 124,000,000 foot-pounds per 1,000 pounds of steam for the crank and fly-wheel engine, a duty of about 100,000,000 foot-pounds can be obtained with the turbine-driven centrifugal pump. In addition to

the small space requirements, a very small foundation is needed for the turbine-driven centrifugal pump. The unit is practically self-contained, and the arrangements of suction and discharge pipes can be worked out in a very simple and inexpensive manner.

Let us assume that instead of replacing an obsolete unit in our plant with one designed for every-day service at best economy, we have the case of a plant equipped with an economical pumping-engine for regular service, and a stand-by unit which is either too small in capacity for the increasing demand, or is worn out or obsolete. In this case a steam turbine-driven centrifugal pump offers the best solution of the problem, for the space requirements of this pump and its appurtenances are such as to require no more room than is occupied by a direct-acting duplex pump of considerably less capacity. Moreover, the price is as low as that of any dependable pumping equipment, and the economy is such that if it is operated for long periods, the operating cost would not be so very much above that of the most economical type of steam-driven pump that they might have installed for their main unit.

Electric Drive.—In the foregoing descriptions of pumping apparatus, steam drive only has been considered, and in many cases there is no reason to consider any other source of power. Where the boiler plant and all of the steam machinery are in good condition it is very difficult to show where a saving can be made by reverting to electric drive, especially in a plant of such size as to require only one man on duty. This one man will be required in any event, and while perhaps a small saving may be effected from the fact that in operating an electrical unit a licensed engineer is not required, it is always necessary to have an intelligent man in charge.

In the way of electrically-driven apparatus there are two types of pumps that are usually considered. These are the plunger pump geared to an electric motor, and the centrifugal pump direct-connected to the driving motor.

The comparison of these two types of pump is very similar to the comparison of the crank and fly-wheel pumping-engine and the turbine-driven centrifugal. The horizontal plunger pump of 3,000,000 gallons capacity would practically be the same

pumping unit that would be driven by the crank and fly-wheel engine, and the direct-connected centrifugal pump would be the same pump as the one driven by the geared steam turbine. As in the case of the steam drive, it is simply a question of fixed charges and operating costs. The guaranteed pump efficiency of the horizontal plunger type pump of this size is about 90 per cent and the efficiency of the centrifugal pump about 80 per cent. These two types of electrically-driven pumps run surprisingly close together in fixed charges and the cost of electric current.

Oil-Engine Drive.—The methods of driving the steam and electrically-driven pumps considered so far are very familiar to all of us, but there is another form of drive that is making headway in pumping-engine service, and the economy of this form of drive is bringing it rapidly to the front.

An oil-engine-driven unit consisting of a diesel oil engine geared in a horizontal plunger pump, of the size that we are considering, can give a duty far greater than the largest and most refined type of steam-driven pumping unit that has ever been built. The duty ordinarily obtained on a cross compound pumping-engine of 3,000,000-gallon capacity is 124,000,000 foot-pounds per thousand pounds of steam. An oil-engine-driven unit of this same size can operate on a cost for oil that would be equivalent to a duty of at least 225,000,000 foot-pounds per thousand pounds of steam.

In the case of the steam engine the economy of a plant will vary greatly in accordance with its size. With the oil engine, however, the efficiency of comparatively small units is almost as good as that of the units of very large size, and this feature is making it a very attractive proposition for water-works pumping installations of small and medium sizes.

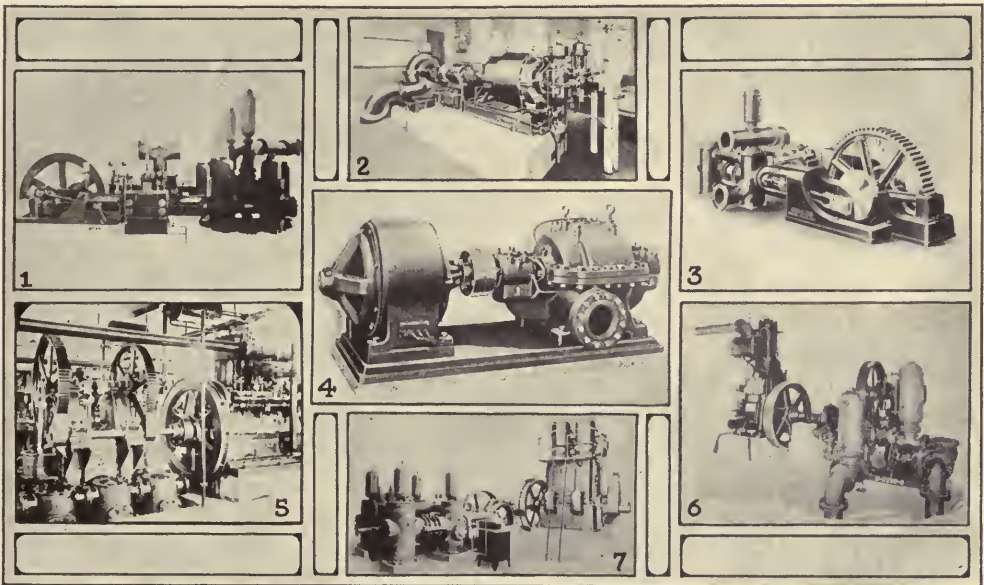
In order to select the pumping equipment for any particular installation, there are many things to be considered and several angles from which the proposition may be viewed. In the tabulation below I have eliminated all items of operating cost that would be practically the same no matter what type of unit might be installed.

As a multiplicity of figures will sometimes obscure the salient points and dwarf their importance, in this tabulation I have taken only the fixed charges, consisting of inter-

est and depreciation and the cost of fuel or current. The interest and depreciation on the crank and fly-wheel pumping-engine are taken as 12 per cent, whereas on all the other types it has been taken as 15 per cent. The cost of coal is assumed at \$8.50 per ton. The cost of current is assumed to be 2 cents per kw. on the basis of an 8-hour day, 1.7 cents on the basis of a 16-hour day, and 1.64 cents on the basis of a 24-hour pumping day.

One of the important factors in considering a problem of this kind is the number of hours a day the plant is to be operated. With a large reservoir capacity 8 hours' pumping will usually suffice. With an

purchasing the highest-grade equipment with an assured long life at high efficiency. If, on the other hand, it would be necessary for them to borrow money to finance the larger expenditure, they would undoubtedly purchase the steam-turbine-driven outfit. With the operating costs shown, the Board would scarcely be justified in installing either of the electrical units unless their boiler plant happened to be in such poor condition that the entire replacement of this part of the station would be required in a short time. There is very little choice between the plunger pump and the centrifugal pump from the standpoint of operating costs, and the probability is that with the



TYPICAL PUMPING UNITS FOR MUNICIPAL WATER-WORKS STATIONS

1. Crank and fly-wheel pumping-engine. 2. Turbine-driven centrifugal pump. 3. Horizontal plunger pump for motor drive. 4. Motor-driven centrifugal pump. 5. Vertical triplex pump driven by oil engine. 6. Vertical triplex pump driven by single-cylinder diesel-type oil engine. 7. Horizontal plunger pump driven by two-cylinder diesel-type oil engine

ample stand-pipe and a small demand at night, many stations operate with two shifts totaling 16 or 18 hours. Other plants pumping against direct pressure have to operate a full 24-hour day.

Comparison on an 8-Hour Basis

On the basis of the 8-hour day any one of the types shown in the table could be selected with good reason. Considering the steam-driven units: While the turbine-driven pump shows a lower operating cost, a Water Board might decide that with the money available they would be justified in

lower investment and the lower operating costs the centrifugal pump would be selected instead of the higher-priced plunger pump, if electric drive should be decided upon.

The oil engine shows a yearly operating cost of \$6,200, against \$6,550 for the turbine-driven centrifugal, and with the steam plant in good condition and the operating force thoroughly trained in handling steam machinery, it would not seem advisable to change to oil for this slight difference in operating cost.

Working 16 Hours a Day Changes Conditions

The tabulation for the 16-hour day shows quite a change in conditions. The fixed charges remain the same, but the cost of fuel brings the most efficient apparatus strongly forward. With the slight difference between the crank- and fly-wheel pumping-engine and the turbine-driven centrifugal pump there is no doubt that the crank- and fly-wheel would be chosen as the greater value on account of the lower fuel consumption and the probability that this type of pump would still be in service twenty or more years after installation, if its capacity should be sufficient for the increased demand; and as the growth of the community is always considered in determining the size of unit, a selection would undoubtedly be made of sufficient capacity for quite a number of years in advance.

On the 16-hour day the two types of

electrical unit are again of about equal operating cost, but these costs are so far above steam operation as to put them out of the running unless current can be obtained at an extremely low price. The oil engine shows to much greater advantage, and a saving of \$2,000 per year in operating costs is something that cannot be ignored.

Operating 24 Hours a Day

The 24-hour day shows a still greater advantage for the crank- and fly-wheel pumping-engine in a steam-operated plant and clearly demonstrates the inadvisability of purchasing electric power for operating under these conditions. The oil engine shows very close to \$3,000 difference in operating cost and from the standpoint of station economy is clearly the best choice in this latter comparison.

ACKNOWLEDGMENT.—Abstract of a paper read before the Annual Convention of the New England Water Works Association.

COMPARISON OF OPERATION COSTS OF VARIOUS TYPES OF PUMPING EQUIPMENT—
CAPACITY 3 MILLION GALLONS IN 24 HOURS—
INSTALLED AS ADDITION TO EXISTING STEAM PLANT

	STEAM DRIVEN		ELECTRICALLY DRIVEN		OIL-ENGINE- DRIVEN
	Crank-and Fly-Wheel Plunger Pump	Turb.-Driven Centrifugal Pump	Horizontal Plunger Pump	Centrifugal Pump	Horizontal Plunger Pump
Cost of unit installed with appurtenances and necessary change to bldg.	\$33,000.00	\$15,000.00	\$17,500.00	\$10,000.00	\$31,000.00
<i>On basis of pumping eight hours per day</i>					
Interest and depreciation.....	3,960.00	2,250.00	2,530.00	1,500.00	4,650.00
Cost of fuel or current.....	2,660.00	3,480.00	6,170.00	6,870.00	1,450.00
Cost of banking fires for 16 hours.....	820.00	820.00	.....	.....	.....
Cost of coal for heating.....	.....	.....	200.00	200.00	100.00
	\$7,440.00	\$6,550.00	\$8,900.00	\$8,570.00	\$6,200.00
<i>On basis of pumping sixteen hours per day</i>					
Interest and depreciation.....	3,960.00	2,250.00	2,530.00	1,500.00	4,650.00
Cost of fuel or current.....	5,330.00	6,950.00	11,010.00	12,100.00	2,900.00
Cost of banking fires for 8 hours.....	410.00	410.00	.....	.....	.....
Cost of coal for heating.....	.....	.....	200.00	200.00	100.00
	\$9,700.00	\$9,610.00	\$13,740.00	\$13,800.00	\$7,650.00
<i>On basis of pumping twenty-four hours per day</i>					
Interest and depreciation.....	3,960.00	2,250.00	2,530.00	1,500.00	4,650.00
Cost of fuel or current.....	7,990.00	10,400.00	15,700.00	17,250.00	4,350.00
Cost of banking fires.....	.....	.....	.....	.....	.....
Cost of coal for heating.....	.....	.....	200.00	200.00	.....
	\$11,950.00	\$12,650.00	\$18,430.00	\$18,950.00	\$9,000.00

Typhoid Fever Death-Rate Lower Than Ever

THE lowest typhoid fever death-rate ever shown for the registration area of the United States was achieved in 1922, according to figures made available by the Department of Commerce on December 28, 1923. Whereas this disease was responsible for a death-rate in the registration area of 35.9 per 100,000 in 1900, the record for 1922 was only 7.5 deaths

from typhoid fever per 100,000 persons.

In some of the more pregressive cities which have given especially intelligent attention to water filtration and chlorination, the safeguarding of the milk supply and other modern methods of public health and sanitation, the typhoid fever death-rate has been brought down to 5, 3, 2, or even less than 1 per 100,000.

A Thousand Miles of New Street Lights

St. Louis Establishes Complete Plans for Street Lighting and Saves Money at the Same Time

IN producing a complete new street-lighting system for St. Louis, 1,000 miles in length, a map was first prepared showing the entire city, zoning it according to traffic and the intensities of light desired in the various districts:

ZONE INTENSITIES USED

District	Maximum	Minimum	Average
Downtown retail	2.25	0.96	1.68
Intermediate zone 1....	1.60	0.64	1.20
Intermediate zone 2....	0.94	0.40	0.70
Intermediate zone 3....	0.63	0.26	0.47
Major streets outside of those above	0.40	0.16	0.30
Residential, heavy traffic	0.22	0.08	0.16
Residential, outlying	0.13	0.05	0.09

In order to attain the intensities mentioned in the table above, a comprehensive study of different street lights was made and a test section of street was equipped with six of the kinds which seemed the most promising. All of these were rejected and the design of a new street light in the form of a refractor lantern was begun. By a proper combination of reflector and refractor plates, this lantern can be made to give symmetric, asymmetric, four-way, or almost any other desirable distribution.

The system will have a potential of not more than 300 volts to the ground at the post head. It is possible to attain this end in several ways by means of individual transformers for each, group transformers, short straight-series circuits or multiple circuits. The multiple can be justified as to installation cost, and data gathered from cities where such a system is in service indicate that its operating costs are not excessive and that its reliability of service is excellent. It means, however, that the street-lighting system must be more or less tied in with the general commercial feeder system and will depend upon the feeder sys-

tem for continuity of service. Where commercial feeders are all underground and where the street-lighting system is installed and operated by the same interests that control the service company, such an installation may be desirable. A city installing and operating its own street-lighting system will, however, scarcely find it advisable to tie in too closely with the service company's feeders, nor will it find it desirable to depend for continuity of service upon overhead transmission which is subject to lightning, rain, sleet and wind.

Short-series circuits were out of the question, so that the choice rested between individual and group transformers, depending entirely upon the size of the lamps to be used and their spacing. It was found that for St. Louis the most economical arrangement consisted in individual transformers for the down-town high-intensity district and for Zones 1 and 2. The remainder of the city will be supplied by group transformers.

Automatic substations will be used throughout the city, which will be tentatively divided into 11 districts. One of these will serve the down-town district and the intermediate zones, and the other ten will be scattered throughout the city. The substations will be located centrally in their respective districts. The down-town substation will distribute to approximately 30 circuits and will have a demand of 2,000 kilovolt-amperes. The other substations will distribute to four circuits and will each have a demand for about 400 kilovolt-amperes. All substations will be operated entirely by automatic equipment.

ACKNOWLEDGMENT.—From an article by Rolf Toensfeldt, Chief Electrical Engineer, Department of Public Utilities, St. Louis, in the *Electrical World*.

Prizes for Stories of Police Service

TO stimulate healthy emulation and morale in the New York Police Department, two contests have been arranged by Police Commissioner Enright, in which cash prizes amounting to \$525 are offered for the best stories written by members of the force telling of their experiences while in the service. The first contest deals with serious accounts of extraordinary deeds performed by any member

of the Department during his time in the service, and prizes of \$200, \$100, and \$50 will be awarded for the best three stories submitted. The importance of the event and the way in which it was handled are two elements that will be considered in determining the winners in this competition. The second contest calls for humorous stories of police service happenings, with prizes of \$100, \$50, and \$25.

Why City Governments Should Take the Lead in Safety Campaigns

By C. W. Price

Vice-President, in Charge of Public Safety Division, Elliott Service Co., New York City

THE primary purpose of government is, of course, the protection of life and property. For this reason, if for no other, the municipal administration in every city of any size should initiate a permanent community-wide public safety campaign or, where such a campaign is already under way or in process of organization, should actively participate in it. Traffic accidents alone now take the lives of more persons each year than all forms of murder combined; traffic accidents now kill more children each year than typhoid fever, scarlet fever and malaria combined; the property loss due to traffic accidents is rapidly approaching the proportions of the annual fire loss. Even aside from humanitarian considerations and moral obligations, and

purely on the basis of sound economic principles and good city government, the public safety movement is of great importance to the administration of every city for the following reasons:

(1) Because the growing seriousness of the accident situation has produced a condition of alarm in every city, has put into every home the fear of accidents either while walking or riding, and has developed a demand that something be done to alleviate this situation—a demand which becomes more and more insistent each year;

(2) Because there is a very strong tendency toward superficial and sporadic safety campaigns conducted without the cooperation of the various municipal departments, which not only fail to accomplish their purpose but leave the community cold and cynical and make it difficult later to start a really constructive safety campaign;



THE EASIEST WAY TO BE KILLED

Playing in the street is the most serious of the four principal causes of traffic accidents to children. The other three are: dashing into the street after a ball or a playmate; hitching on to wagons, trucks and street cars; and stepping into the street from behind an obstruction without watching for approaching vehicles

(3) Because public accidents contribute to the high cost of government by calling for more police protection, fire protection and hospital facilities, by increasing the number of dependents who must be cared for at the municipal institutions, by the destruction of municipally owned property, and by piling up damage claims against the city;

(4) Because public safety work provides a common ground on which representatives of the various city departments can become acquainted with and work with all the important business interests, regardless of political affiliations. The cooperation and expert service which a city government may secure from these interests are of inestimable value, not only in the prevention of street accidents, but in the general administration of municipal affairs;

(5) Because of the confidence and good-will which will accrue to the city government through the public's appreciation of the city's efforts to eliminate a menace which touches every home, and because of the greater respect for municipal government and its representatives which will result from such confidence and good-will;

(6) Because there never was a time so propitious as now for securing the cooperation of an entire community in an effort to reduce street accidents.

Let us consider these reasons one at a time.

Alarm Becoming Wide-spread

It is not difficult to understand the presently alarmed condition of the public mind—as revealed in the front-page publicity which the traffic accident problem is receiving in every city every day—when we stop to consider that the number of persons killed by automobile accidents has jumped from 374 in 1906 to 15,000 in 1923; that there are now 15,281,295 motor vehicles on our streets and roads; that vehicles are being added at the rate of 3,000,000 to 4,000,000 a year; and that a study of the statistics of motor vehicle accidents and of the number of motor vehicles in use since 1919 shows that, for every million additional motor vehicles put into use, 1,000 additional persons are killed each year and 25,000 persons are injured. Imagine what the condition will be when the number of machines on our streets is doubled—and indications are that it will be doubled within five years or less.

In the midst of the alarm and indignation following each serious accident, all sorts of remedies are suggested. Some people say we need more police or better police. Others say we need judges who will impose heavy fines or put traffic law violators in jail.

These critics fail to realize that you cannot club a community into being good or being safe; they do not realize that the enforcement of traffic laws and regulations is possible only in a community where public opinion has been developed to the point, first, where it tolerates law enforcement, and, second, where it demands law enforcement. While it is true that the traffic officer is the best safety device in existence, it will never be possible in any city to provide sufficient police to cope with the situation through law enforcement alone. The police department at best can supervise and control only a small percentage of motor vehicle drivers, and that only at certain street intersections.

Tendency Toward Superficial Campaigns

While it has been demonstrated within the last two years, by the experience of cities of such extremely divergent characteristics as New York, Pittsburgh, Washington, Louisville, and Baltimore, that it is possible to prevent a large percentage of all street accidents, scores of cities have conducted safety campaigns which not only failed to accomplish their purpose but left the community cynical as to the possibility of reducing the street accident toll. In practically every case this has been so for one of two reasons—either the community was not informed concerning the activities that have proved successful elsewhere, or an attempt was made to conduct a campaign without the cooperation of the entire community.

Just as it is impossible for any municipal government to conduct a successful safety campaign without the assistance and cooperation of the local public utilities, the local chamber of commerce and various other civic, social and business organizations, so is it impossible for all these interests combined to conduct a successful safety campaign without the full cooperation of various municipal departments, particularly the police department, the fire department, the schools, and the street department. In many cities, although there was hearty cooperation between the administration and the community at large, safety campaigns have failed to bring about any permanent reduction in accidents because—through ignorance of the relative importance of the various fundamental causes of



LEARNING THE PROPER WAY TO CROSS THE STREET

The little traffic officer in the center is telling the four pedestrians that in crossing the street they should look first to the left, and then to the right, because on the first half of a street all the vehicles come from the left, and on the other half from the right

accidents—too great attention was given to comparatively unimportant causes and to merely novel or spectacular activities, with the result that the community lost sight of the principal causes, and neglected activities which, though less spectacular, have been found more effective.

Accidents and the High Cost of Government

City officials are naturally interested in reducing taxation, and yet, because of the newness of the problem, few of them appreciate the extent to which public accidents tend to increase taxation and in other ways contribute to the high cost of government. In the first place, a recent study shows that there were more than 28,000 municipally operated motor vehicles on our streets last year and that these vehicles cost more than \$78,000,000. Investigation has shown also that commercial vehicles, though constituting only one-tenth of the total number of motor vehicles in use, are involved in 40 to 50 per cent of all traffic accidents. This is so simply because they are in use all day and every day. The 28,000 municipally operated motor vehicles fall into this class and are therefore involved in this high pro-

portion of accidents, with the resultant claims for property damage and compensation for deaths and personal injuries. The problem of driving a fire engine, an ambulance, a patrol wagon or any other municipal vehicle is becoming more and more difficult, and fatalities and serious injuries not only among the drivers of such vehicles, but even among traffic officers, are increasing in direct proportion to the increase in such accidents among civilians. In addition, every city is constantly being put to the expense of paying damage claims growing out of accidents to motorists and pedestrians in which the city was held responsible because of the condition of the streets, the sidewalks, or other municipal property.

A thoroughgoing safety campaign not only leads to a reduction of the number of such accidents, but gives the people a better appreciation of their own responsibility for preventing accidents and thereby holds down the number of claims filed against the city.

Safety Work Provides a Common Ground

In those cities where the representatives of city government have been thrown into intimate contact with the general business

interests during a public safety campaign, these two classes of men have invariably come out of such contacts with a better understanding and a better appreciation of each other, and they have been able to cooperate to their mutual advantage in phases of city government entirely unrelated, or only indirectly related, to the accident situation.

An excellent example of such cooperation is to be had in a solution of the traffic congestion problem, which is tied hand and foot with the accident problem. Traffic congestion in many cities to-day is due largely to a lack of cooperation between these business interests, such as the electric railways, the trucking companies, taxicab companies and other operators of commercial vehicles, a lack of cooperation between these interests and the city government, and a lack of exact information of the traffic conditions on various streets. There have been demands for parking laws, one-way streets, safety zones and traffic regulations of various sorts, and in many cases, because of an insistent public demand, such laws and regulations have been put into force prematurely and not as a result of a careful survey revealing the need for such regulations. On the other hand, in cities where the municipal officers and important public interests have cooperated in the conduct of safety campaigns, these campaigns have nearly always led to intelligent study of traffic conditions, in which the various business interests made available to the city the services of experts, and facilities which enabled the police and street departments to do quickly and thoroughly what they could never do alone. City officers, by actively identifying themselves with the safety campaign, can secure the cooperation and expert advice of men in the automotive industry, electric and steam railroad industries, taxicab and trucking companies, insurance companies, and the various other business interests financially affected by street accidents.

Helps to Build Up Good-Will

City officials to-day generally recognize that the only way to build up public confidence and good-will is to render a definite service; the day for trying to accomplish this merely by talking or promising is past. Inasmuch as the most precious thing on earth is human life, it is evident that any-

thing which is done to conserve life, especially the life of little children, will be appreciated by citizens, and particularly by fathers and mothers.

In the last city in which the writer participated in a safety campaign, the active cooperation of the Commissioner of Police and the Chief of Traffic within a period of three months changed the attitude of the public toward the police force from one of bitter criticism and lack of confidence to outspoken appreciation and recognition by the press and the most prominent citizens.

We must look in the face the disagreeable fact that many business men are still obsessed with the idea that city officials are politicians and are therefore neither efficient nor sincerely interested in activities that will make for community betterment. In view of the fact that accidents vitally affect every business man, not only on account of his financial interest but because of his family, there is nothing that will so quickly win his confidence and cooperation as for city officials to actively participate in a community-wide campaign for the reduction of street and home accidents.



PUZZLE—FIND THE SAFE PEDESTRIAN

Only the man with the bundle on his shoulder is crossing the street at the crossing. All those outside the painted lines are jaywalkers who are flirting with accidents

Most Propitious Time for Starting Safety Campaigns

There never was a time so propitious as the present for inaugurating a community-wide safety campaign. Practically every city in America is looking for some solution of its traffic accident problem. Scores of cities are starting some sort of safety campaign or talking about starting such a campaign. Most of these campaigns will turn out to be superficial affairs, with the unfavorable results already mentioned, unless the municipal administration, from the mayor down, provides real leadership and

cooperation. It is no longer necessary to experiment, nor is it necessary to undertake a great list of expensive activities. For out of the experience of some two dozen cities, and particularly out of the experience of the five cities that have conducted the most successful safety campaigns of the last two years, there has been developed a simple program for community safety, based on just five fundamental activities, which can be adapted to a city of any size, and which, given the proper leadership, is practically certain of success. This plan will be described in a subsequent article.

Civic Psychology and Municipal Taxation

By Arland D. Weeks

LET us say that citizen John Doe spends three thousand dollars a year in living expenses and that of this he spends in taxes a hundred dollars. Twenty-nine hundred dollars go thus in buying things individually, and a hundred dollars go in joint purchase of utilities with other citizens. The ratio is 29 to 1. His interest is accordingly about twenty-nine times as great in private affairs as in public. Moreover, he can see and handle the things he gets for the twenty-nine hundred dollars, while the money spent in taxes secures utilities of rather intangible and non-identifiable character. He may buy sanitation with some of the tax money, but who can get enthusiastic about an immunity? He may be thoroughly convinced that what he spends in public purchase is well spent, but he is deprived of the satisfaction of personally planning the purchase and carrying out the transaction and taking home the goods. The intangibility of public purchasing deprives the time-honored art of buying of its dramatic, speculative and concrete elements. Just as the child feels defrauded of an experience when his parents do all the buying and handle the money, so the average man, while assenting to community buying as a necessary practice, nevertheless actually takes more pleasure in buying five dollars' worth of fishing tackle than in joint purchase with a mass of fellow citizens of a municipal structure costing four million dollars.

Related to the citizen's unimaginative reaction to public expenditure, which is far and away the most economical type of expenditure for net utility, is his singularly atavistic tax psychology. Say "taxes," and the average citizen tends to look downcast. If there is anything a man, economically speaking, ought to be cheerful over it is economical buying. But does the citizen feel happy over well-spent taxes—over the tax bill? Added to reasons given above touching the psychology of public affairs, there is in the case of taxes—public taxes—the weird phobia that derives from the tea in Boston harbor. There was a time when taxation was identified with tyranny, as in the murderous and unrequited taxing by church and state in France in the heyday of monarchical humbug. When officialdom consisted of a super-cargo of licentious tax-eaters, the peasant was justified in gritting his teeth. But now? Don't we want to pay for anything? Should one not rather pay a hundred dollars to the school district than pay a thousand for private tutors? Yet the tax bill throws us into berserker mood. Observe, too, the refined consideration of allowing the other fellow to report more fully his holdings, and the modesty of dodging where possible.

How far the tax emotions are askew may be judged by noting how indifferent the individual is to private taxes—by which is meant the levy of monopoly or profiteering.

In a western state an enigmatical rise in the price of coal in one year represented an increase of outlay equaling a sum which would have raised the pay of every school-teacher in that state by several hundred dollars. Was there outcry, as would have been the case if the same sum had been added to the tax bills? Possibly no government could survive like increase in the immediate compensation of its employees. But the added burden in privately contracted debts is followed by no angry reaching for the pillars of the temple. Public expenditure is the first point of attack when the citizen would protect his income.

The reforming of mind on taxation is one of the heavy problems of democratic government in a time when there is a narrowing boundary between anarchy, on the one hand, and intelligent socialization on the other. Can rational attitude and suitable emotion be engendered? When one recalls the objects to which emotion has devotedly attached itself in the years of history, is it too much to hope that with time may come a moral and intellectual readjustment with regard to public effort, public expenditure, community utilities and the economy of making the same amount of money go a longer way? The human mind has immense possibilities of education in wrong directions; why not in the right?

A needed attitude toward public expenditure may be stimulated by ocular evidence in the form of bargain demonstration, of which an example may be cited. In western states is known the rodent exterminator. Gophers and prairie dogs invade grain fields and wallow and destroy. They eat and destroy millions of bushels of grain. Hence the rodent exterminator. With baits and poisons and knowledge of rodent psychology, the rodent man goes on his way, being paid out of the public taxes. Mathematics being an abstract science, it has been found that statistics have no particular hold on the mind of the member of the board of county

commissioners. But the rodents' bodies heaped up in the tonneau of a motor car convince. For giving the eye of faith an eye-ful, it has been found by rodent exterminators that nothing does so well as heaping up the bodies of the dead rodents in a car and running such car into the very presence of the county chairman and his board and pointing to the dead gophers and prairie dogs and saying: "Lo, here!" No mental picture of the slaughtered rodents has the persuasive power exercised by the actual physical carcasses, slithering and quaking with motion and drawing the vigilant fly when the engine stops and the crowd gathers. Death is impressive, especially with no process of memory or of imagination intervening. By method the rodent exterminator draws tax warrants in the blood of the slain and evokes his own pay check. He satisfies the taxpayer.

No matter whether one justly prides himself upon the clearness of his images and the definition of his principles or not, he is more firmly convinced and is refreshed in resolution by demonstration. People will not be won to their own welfare unless they see signs.

One of the larger activities in popular government must be that of adequate demonstration. Not that every service can be photographed, but at least demonstration can be carried far enough to give the citizen solid ground on which to stand while forming his mind intelligently toward social program and duties.

. . . But of civic psychology in the constructive and idealistic sense how little we know. We want not such study of the voter as will perpetuate his deficiencies, but rather enlarge his constructive possibilities and make him a smoothly functioning intelligent unit in the greatest adventure of mankind — self-government. From the known ground of individual and private-life psychology it should be possible to conduct motive and will, habit and conviction, over to skillful and happy cooperation.

Those "Burdensome" Municipal Taxes

Because of the present attempt to frighten the American people into believing that expenditures for municipal improvements are a burden rather than a benefit, the accompanying paragraphs have special timeliness and interest. They are from the chapter on "The Psychology of Public Business," in Dean Weeks' new book, "The Control of the Social Mind," reviewed briefly on page 219 of this issue.

Zoning as a Traffic Safety Measure

Creation of Blind Corners Prevented by Special Provision for "Vision Clearance"

By Charles F. Fisher*

SAFETY councils, traffic committees, city councils and public authorities generally are everywhere striving to reduce traffic congestion and make our highways safer for vehicular and pedestrian traffic. Notwithstanding all efforts and regulations, government reports show that the number of traffic injuries and fatalities continue to increase. The traffic problem



TWO PROJECTING STORES IN THIS RESIDENCE DISTRICT MAKE TWO BLIND CORNERS AT ONE INTERSECTION

is so great, and the most effective remedy for street congestion—adequate and suitable traffic streets—is so costly and difficult of attainment, that any available method of preventing or eliminating conditions contributing to traffic accidents should be employed. Zoning is such a measure.

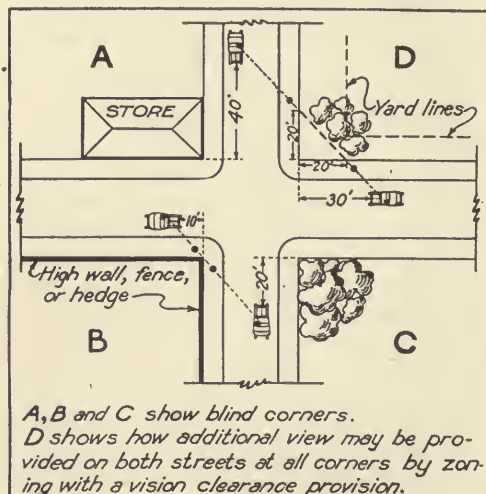
In zoning, the creation of certain traffic hazards and the maintenance of others may be prevented. "Blind corners," which greatly restrict the vision of pedestrians and of the drivers of vehicles approaching the street intersection, constitute a traffic menace responsible for many accidents, particularly on narrow, steep or crooked streets. About 60 per cent of all traffic accidents occur at street intersections.

Blind corners are frequently created by buildings used for stores or other business purposes. Zoning, which keeps such uses out of residence districts, contributes in a general way to traffic safety. A further aid is the establishing, in the zoning ordinance,

of setback lines in residence districts.

By including a special "vision clearance" provision in the ordinance and thereby further restricting the creation of blind corners, zoning may make a more direct and effective contribution to traffic safety. It can accomplish this not only by prohibiting the erection of buildings, high walls and fences on the street line, but also by prohibiting the planting or maintenance of shrubbery or foliage within a determined front-yard area on corner lots that will obstruct the view at street corners. By making the front-yard regulations apply to small local business districts, the vision clearance provision also applies to these districts, and additional corners are thereby kept free of traffic hazards.

The zoning ordinances of some Ohio cities, including East Cleveland, Akron and Columbus, and of Rhode Island cities, including Providence and Woonsocket, and



possibly the ordinances of some cities in other states, contain special vision clearance provisions.

In the Providence and Woonsocket ordinances, the provision is as follows:

"Vision clearance on corner lots.—On a corner lot, no fence, wall or structure more

*Mr. Fisher is associated with Robert Whitten, City Planning and Zoning Consultant, of Cleveland and Providence.

than $3\frac{1}{2}$ feet in height above the plane of the established grades of the streets shall be erected on any part of a front or side yard herein established that is included within the street lines of intersecting streets and a straight line connecting said street lines at points which are 20 feet distant from their points of intersection, measured along said street lines, and no planting or foliage shall be placed or maintained within such area that in the judgment of the Inspector of Buildings will materially obstruct the view of a driver of a vehicle approaching the street intersection.

It is possible that the application of this

principle might reasonably be extended. Additional traffic security would be provided by requiring high embankments at street corners to be cut down to an elevation of $3\frac{1}{2}$ feet above the level of the street and by requiring all buildings on corner lots, upon which no front yard is established in the ordinance, to leave a certain percentage of the corner of the building open so as not to obstruct entirely the view of pedestrians or vehicle drivers within 10 to 20 feet of the street corner.

Monthly Reports Consolidated Into Annual Report

To the Editor of THE AMERICAN CITY:

Believing that the methods of reporting in use in Lynchburg may be of interest to other municipalities, I send you the following outline as a possible supplement to your January article on "Preparing the City's Annual Report":

As you know, this city prepares a monthly report which contains in considerable detail the activities of each department. Included as a part thereof is a complete financial statement which contains not only a record of the appropriations, monthly expenditures and appropriation balances, but also a detailed statement of revenue, together with a general monthly balance sheet. These financial statements in connection with the record of departmental activities furnish ample data with which to judge the economic conduct of each operation as well as the general worth thereof. The monthly report is accordingly prepared largely for the information and benefit of those directly responsible for the administration of the municipality.

This report is prepared by mimeograph and is usually available within ten days after the close of the month. About fifty copies are made and distributed to the heads of the various departments, the City Council, and a few others who are particularly interested in the work of the city. Copies are also placed in public reading rooms such as the Library, the Y. M. C. A., various clubs, etc.

As soon as the report of each department is edited, it is passed to the newspapers, so that it becomes available to the public even before the complete monthly report is ready for distribution. By handling it in this manner we have found that the newspapers are able to give more space than would be possible were the report handed to them as a whole. Again, some phase of the city's activities is placed before the public during almost every one of the first ten days of the month.

The annual report is, of course, a consolidation of the year's monthly reports, but it is prepared with a different purpose in mind. The monthly reports are intended primarily for the use of those charged with the responsibility of the conduct of the city's affairs, and are prepared accordingly. The annual report is issued largely for the information of the public and hence it is designed to meet somewhat different requirements:

1. As the average person is little interested in details, the report is general in its nature.

2. The casual reader is usually repelled by statistics; hence that feature is limited wherever possible and reading matter and charts are substituted therefor.

3. The report is designed to furnish a general history of the activities of the city and the contents are therefore limited exclusively to a statement of fact. Conclusions are largely left to the reader. Plans for the future are omitted; that, in my opinion, being a matter for the budget. Prophecies are taboo.

4. As the public is little concerned with the methods employed, but greatly interested in the results attained, each subject is treated as briefly and as concisely as is consistent with an accurate statement of fact.

With the foregoing requirements in mind each departmental report is prepared within the department itself and comes to this office, where it is edited by the City Manager, the department head concerned and the heads of two or three departments having no relation thereto. In this way technical details are to a large extent eliminated. By having the advice of a disinterested department the subject is to some extent treated from the view-point of the average reader, for whom the report is primarily intended.

It has been our endeavor to have the annual report available promptly following the close of the fiscal year. The public is little interested in a report covering a period several months in the past. Our year closes January 31. Our report for 1922 was off the press and available

for distribution during the last of April, about two and a half months after the end of the fiscal year. This year we hope to have the report out earlier. One thousand reports were published for 1922, the cost of which was \$913.38, complete, including photographs, cuts, etc.

Incidentally, in line with the purpose of making this report interesting and readable, it is my opinion that photographs and charts carry greater weight and more completely tell the story than is possible through the use of an equal space for printed matter, particularly statistics.

A number of years before the change in the form of administration in Lynchburg, it had been the practise of this city to print the reports of its various departments as the annual report of the city. These reports were voluminous and largely statistical and were of so little interest to the public that they were finally abandoned.

In its stead, the city then printed a financial statement which likewise was entirely statistical. These, too, were of little public interest, and with the change in administration the present form was adopted.

During the preparation of the annual report and as soon as a subject has been edited, it is handed to the papers; this being the same practise followed with respect to monthly reports. When the report is completed and available for distribution, copies are sent to those included in the list for monthly reports. Through the newspapers an invitation is given to the public to call for a copy. In this way the distribution is limited to those who are really interested in the report. About 900 copies of the 1,000-copy issue of last year's report were distributed in this manner.

E. A. BECK,
City Manager.

Lynchburg, Va.,
January 8, 1924.

Aims and Ideals of a Greater City

By George M. Verity

President, The American Rolling Mill Company, Middletown, Ohio

EVERY project, every enterprise, every crusade must have a definite goal towards which it is working if progress is to be made. It will not do to be simply going somewhere; even if we think we are happy on the way, we must have a definite destination toward which we are working, day by day and year by year.

If we but study history we shall find that the great men and women of the past have either made some outstanding sacrifice or performed some great service in the interest of humanity. *Sacrifice* and *service* are the foundation of all greatness, whether it be individual or collective.

If we dream true, our Greater City will, by sacrifice and service, comprise:

—A community which in its individual life, in its business life, in its religious, social, educational, and artistic life, typifies the highest of human, social, and moral standards;

—A community in which every sound-hearted, right-minded man and woman has learned the art of free cooperation in everything that makes for community life;

—A community in which every citizen is contributing fairly of his or her physical, moral and financial strength, in proportion as God has given him or her health, strength and means, towards the upbuilding of the

community through the support of its established institutions;

—A community in which, through the generosity and cooperation of its citizens, every needful facility known to modern civilization that will add to the life, liberty and safety, the moral, intellectual, social and educational advancement, and the happiness of its people as a whole, is provided and maintained;

—A community in which no worthy human being, man, woman or child, is denied such human assistance or sympathy as may be needed to tide him or her over days of distress;

—A community in which love, loyalty, and duty to neighbor, city and nation are an all-consuming ambition, and where the "brotherhood of man" in its highest interpretation is practised more than it is preached;

—A community in which moral, material and educational advancement always go hand in hand.

A people striving for such a goal will be lifted above the many humdrum and more or less grinding experiences of daily life and toil to a plane of living in which work becomes ennobled, and service to friend, neighbor, and community a privilege and a pleasure.

Modern Carthage Builds a Forest

A Civic Investment Which Will Pay Big Dividends While Protecting the Village Watershed

By G. H. Collingwood

Extension Forester, U. S. Department of Agriculture

CARRYING coals to Newcastle seems little more preposterous than the planting of little trees with which to reforest the lands around an American lumber town. Carthage is a village in St. Lawrence County, New York. It was built by lumbermen, and to-day its prosperity is largely sustained by the large pulp and paper mills which, to a considerable extent, have replaced the sawmills. Yet Carthage has planted nearly 500 acres to little forest trees. She has entered into a program which will give her at least 2,000 acres of man-planted forest.

About twenty years ago, Carthage realized that she must do something to insure a safe and adequate water-supply for her people. So the city fathers explored and found a tract of land back in Lewis County well supplied with springs of pure water. Acting upon their advice and, no doubt, not without a struggle, the village purchased 2,000 acres of land which surrounds and protects the springs. The land was sandy and of no particular agricultural value, although attempts had been made to farm it. On some portions, a little second-growth timber had come in. Even after dams were built and the water was piped about sixteen miles down to the village, the surrounding land remained neglected. At various times, fires swept over the tract, blow-holes developed in the sand, and silt washed into the reservoirs, until they were filled up. This made it necessary to construct settling-basins, and to make annual provisions for cleaning them out.

After a while, the water-works board came

to the conclusion that to provide pure water was only part of its job. It must consider how to handle the land which surrounds the reservoirs. It was impracticable to farm it, and besides, ordinary agricultural operations would encourage erosion, which would, in turn, more rapidly fill up the reservoirs and settling-basins. They compared the open land with the near-by woods, and decided that the thing to do would be to put the land back under forest cover. This land had once supported a dense forest; why shouldn't it do so again? Many of the older citizens could remember when the timber was cut to make logs, and the hemlock bark was peeled to supply a near-by tannery. This gave confidence to the men, so they went further.

Help from the State Conservation Commission

As a municipality they found that Carthage could get all the little trees they needed from the nurseries of the New York State Conservation Commission for 50 cents a thousand, plus the cost of transportation. In the spring of 1913, they



STORAGE RESERVOIR OF THE CARTHAGE WATER-SUPPLY
This is surrounded by 2,000 acres of land, much of which has been reforested during the last eight years. Within ten years the entire watershed will be under forest cover

put out 20,000 four-year-old transplants of Scotch pine, at a cost which did not exceed \$8 an acre. Since then, a few thousand have been planted each spring, until more than 600,000 trees have been set.

The trees are planted in the sod, approximately 6 feet apart, so that it takes about 1,210 to cover an acre. Practically 500 acres have been planted, and the job is hardly started. Most of the trees are Scotch pine, which, while not as good a timber tree as white pine or red pine, grows rapidly and is remarkably free from insect and fungus enemies.

Scotch pine is a native of Northern Europe and is grown in many of the carefully tended European forests. It is used for railroad ties, construction timber, and boxes. Many of the toys which are shipped to this country from Germany are made of Scotch pine wood.

Since 1920 a few thousand white pine have been set. To insure that these may be free from the white pine blister rust, all the currant and gooseberry bushes over the planted area and around it for 900 feet have been pulled.

Mr. McWilliams, the present superintendent of the water-works property, deserves much credit for the way he has developed his system of planting, and for the low costs which he has maintained. The trees stand in rows, and in all of the plantations where three- and four-year-old transplants were used, not less than 95 per cent of the trees are living. The one- and two-year-old seedlings have not proved so successful.

Prospective Returns

Many of the older trees are from 15 to 20 feet high, with a stump diameter of 6 inches or more. They are far from being merchantable, but already they have crowded out the weeds. The shade from the branches and the layer of fallen needles have begun to protect the soil and to aid in holding water with which to maintain the springs, which in turn keep the Carthage reservoirs filled with pure, clear mountain water.

Fields which a few years ago furnished scarcely enough grass to pay for cutting are now producing an annual crop of wood amounting to more than 2,500 pounds an acre. Within the lifetime of many who are now watching these trees grow, their contents may reasonably be figured in terms

of merchantable board feet. Before fifty years are past, it will be possible to cut saw logs from the area, although naturally another fifty years will make possible the cutting of much larger and more valuable logs. Once well established to forest growth and placed under careful management, such an area as this might furnish a million board feet of lumber every year, without in the least detracting from its value as a part of the Carthage watershed. A million feet of lumber every year will keep a fair-sized mill going, and should give profitable employment to a number of men. At present freight rates, a million feet of lumber grown at home instead of being shipped across the continent, will save between \$15,000 and \$25,000 in freight.

The water-works board is going ahead, and during the next ten years expects to finish the planting. That will give Carthage a municipal forest of 2,000 acres. She



AN AMERICAN PLANTED FOREST 50 YEARS OLD, SHOWING HOW A MUNICIPAL FOREST OF THIS AGE WOULD LOOK IF UNTHINNED, THEREBY NOT PERMITTING THE BEST GROWTH OF THE TREES

has taken a place among those American cities that are pioneering in a new form of civic investment. It is new in this country, but was old in some parts of Central Europe when the Pilgrims came to America. One can find a number of examples in Germany or Switzerland or the Scandinavian countries, where the municipal forest has proved a most satisfactory investment.



A VIEW OF A 50-YEAR-OLD FOREST WHICH HAS BEEN THINNED OUT AND WHICH COULD BE USED WELL AS A PICNIC GROUND

Watershed Reforestation in Other New York State Cities

Similar work is possible in various other American cities and villages. In New York State alone an investigation instituted by the Bureau of Municipal Research revealed the fact that twenty-six cities own and control 220,000 acres of watershed in connection with their municipal water systems. Of these 220,000 acres, approximately 8,000 acres have been reforested by the municipalities; 80,000 acres are wooded; and 3,000 acres are farm land. There are, therefore, approximately 130,000 acres which can and should be reforested.

A list of the New York State cities which have already started to reforest their municipal watersheds includes Amsterdam, Cortland, Elmira, Gloversville, Glens Falls, Ithaca, Johnstown, Little Falls, Middletown, New York City, Newburgh, Syracuse, Salamanca, Troy, Yonkers, and Rochester, together with the villages of Canton, Malone, and Waverly. While it is true that the areas already reforested by the cities of New York and Rochester exceed the work thus far accomplished by the village of Carthage, the proportion of forested land to the number of people served is far greater in Carthage.

Cost and Income

The cost of reforesting the 130,000 acres already mentioned would be about \$1,000,000. An acre of such land should yield not less than 500 board feet per acre per year, and more under favorable circumstances. When ready for cutting, this lumber may be estimated to be worth at least \$15 per thousand board feet on the stump. At the end of forty years, these 130,000 acres, if reforested now, should yield not less than 2,600,000,000 board feet of lumber. At present prices, this is worth in the neighborhood of \$39,000,000, which represents a net annual income of \$975,000—an excellent return on the investment.

Protection and Revenue

It becomes apparent, therefore, that a city which reforests its watershed benefits in two ways: first, it protects its water supply, which is exceedingly important; second, the revenue that the city will ultimately receive for the timber that may be cut and sold will more than pay for the cost of reforesting, and the interest on the investment. In the case of many cities, a third benefit may be added—the esthetic and recreational advantages of certain portions of the area as a public park.



PLAY DAY IN WESTCHESTER COUNTY, NEW YORK

County Recreation Program Helps Small Towns and Villages

By Mrs. Chester Geppert Marsh

Director of Recreation, Westchester County, New York

“NOT money, but the life a community provides, constitutes its wealth.”

The average small town or village does not always recognize the value of a recreation program. It is reluctant to admit that the childhood of to-day is any different from the childhood of yesterday. The necessity and value of a recreation program has been the subject of a long series of heated discussions, and funds have been hard to raise. In a great many cases a haphazard program has been established, with either inexperienced volunteer workers or untrained leaders, that does not function properly and only succeeds in stirring up factional difficulties.

The Special Recreational Needs of Westchester County

Westchester County presents a particularly difficult problem in that it is situated so near to New York City. It is all too easy for the adolescent boy and girl who are looking for excitement and fun and have little to claim their attention in the

small towns to go to the city and find the wrong sort of enjoyment in commercialized recreation. The greater part of the residents of the county are New York business men who commute daily and whose civic interests are in New York. Their children, however, spend the most formative and impressionable years of their lives in these suburban communities and it is essential that their recreational needs be given careful thought.

With four of the larger cities of the county providing play spaces and an all-year program, and recognizing the need of the smaller towns and villages to provide play spaces and play opportunities, the County Supervisors created a County Department of Recreation with a Director at its head to advise, assist, and stimulate all the cities and villages of the county in this vital need of the community—the building up of high ethical standards of play, clean, wholesome bodies, and alert minds in the men and women of the future.

So far, since the appointment of the County Director of Recreation on May 24

last, the program as outlined and partly accomplished is as follows:

What Has Been Planned and Accomplished

Four new playground systems have been opened, making twelve in the county.

An organization of the executives of these twelve recreation systems has been effected and will meet monthly throughout the year. This organization is of especial benefit to the workers in the small communities who miss the contact and inspiration of workers' conferences as held in larger cities.

The Westchester Trails Association has been organized, whose object is "to promote and foster the appreciation, understanding, conservation and use by the community of the natural beauties of Westchester County; * * * * *; to assist as far as possible the efforts to develop and improve community recreation." The membership is open to any resident or taxpayer of the county over sixteen years of age. Under this Association units will be organized by the recreation leaders in each community and a schedule of local hikes arranged. Several large county hikes are already planned—two over night, and one terminating in a big winter carnival.

A County Choral is under way, with units in all the communities, giving individual concerts during the winter, and coming together in the spring for one big county music festival.

In one district where there are several villages in one township with no large cities, an appropriation has been made by the town supervisors to provide for a township director of recreation who will organize and supervise the recreation of all communities. This is a new venture which, it is hoped, will solve the problem of rural recreation, bringing to isolated communities really good, trained leadership where the right kind of leadership is so much needed.

The County Play Day

To stimulate the play programs on all playgrounds, a play day was arranged which proved very successful. Ten of the twelve communities took part, with a three-fold result: organized play on a large scale was introduced and a visual demonstration made to the people; the first new county park was opened; and for the first time

thousands of grown-ups and children in the county were brought together in democratic, uncommercialized recreation.

Every organization entered heart and soul into making the day a success. The County Park Commission opened up Mohansic Park and turned its entire force to making baseball diamonds, tennis, volleyball and quoit courts. A natural amphitheater was selected for the demonstration, with a hill on one side for the audience and the band-stand, where the Boys' Band from the Children's Village discoursed music during the day. Across the field, where the different contests were held, ten tents were pitched for the ten communities competing. These were decorated with pennants and banners of the colors of the cities and villages, lending an old English tournament aspect to the scene.

The County Federation of Women's Clubs provided the transportation facilities. Trucks and automobiles were furnished and each of the ten communities represented sent to the park from 150 to 250 children and adults, some of them having to drive over 35 miles. Many of the trucks were lent by the owners for the occasion. The Federation also conducted a lunch and refreshment stand on the grounds, which was one of the busiest places of the day.

The Westchester County Children's Association handled all the publicity for the day, besides providing many of the officials and otherwise rendering great assistance. The recreation executives and playground directors entered heartily into the plans, and, needless to say, the children were more than enthusiastic.

In consultation with the recreation superintendents, five events were selected for competition for the boys and five for the girls. Rules and regulations were sent out from the office of the County Director, and everyone went to work with a will.

The great day, September 15, arrived, and from ten o'clock in the morning until twelve o'clock noon, truck load after truck load drove into the landing station with its hooting, yelling, singing, squirming, wriggling boys and girls, and the more quiet and sedate but none-the-less enthusiastic adults. One thousand adults and twenty-five hundred children there were, and the following program was carried out without a hitch or an accident, except one dog fight, and that was not on the schedule:

WESTCHESTER COUNTY FIRST ANNUAL
PLAY DAY, MOHANSIC PARK
September 15, 1923

PROGRAM

9:00 to 10:30 A. M.

Arrival on grounds. Checking lunches, etc. Locating booths

11:00 A. M.

Assembly call

Arrival of the Spirit of Westchester County

She summons the Joys of Recreation. They, in turn, summon the Westchester Playground children who take part in the following:

Call to the colors

Raising of the flag, by Boy Scouts of the county

"America," by people and band

Folk dance exhibition:

1. Klap Dans
2. Jump Jim Crow
3. Oats, Peas, Beans
4. Looby Loo
5. Seven Jumps

The Spirit of Westchester summons the playground teams to the contests:

- | Girls | Boys |
|--------------------|----------------|
| 1. Jackstones | 1. Baseball |
| 2. Newcomb | 2. Volley-ball |
| 3. Playground ball | 3. Punch-ball |
| 4. Dodge ball | 4. Quoits |
| 5. Tennis | 5. Tennis |

12:00 M.

Call to lunch—six blasts on bugle. All assemble under apple trees.

Address by Wm. Delavan Baldwin, President, Westchester County Park Commission

1:00 P. M.

Continuation of contests

Folk dance contest—Klap Dans

Special activities:

1. Tarantella, by two Italian girls
2. Camp Fire Girls' ceremony
3. Log dancing, by boys from the Children's Village
4. Races, relays and stunts

4:00 P. M.

Assembly—six blasts on bugle. All children report to tents. Check up.

Recessional: All children assemble in front of the band-stand.

Announcements: results of the contests

Presentation of trophy

Retreat

Lowering of flag by Boy Scouts

"Star-Spangled Banner"

At the close of the day 2,500 children, still yelling, still singing, started on the homeward journey, wishing that County Play Days would come more often, and laying plans for the next one.

And the value of the day—on each playground, in each recreation system, the children had been working continuously, all summer long, for an objective: to see who was going to get on the team; who were going to win, for their own home town, the outdoor gymnasium, which had been given as a trophy for the city or village winning the greatest number of points on

Play Day. Elimination contests were held on each playground, attendance more than doubled, and, above all, the recreation program in each community was strengthened and stimulated, and new communities were encouraged to establish the work.

Plans for the Future

That the county program of recreation can be said to have passed the purely experimental stage is evidenced by the fact that in January, 1924, by action of the Board of Supervisors, a County Recreation Commission of five members was appointed, thus making a definite department of recreation and giving a firm foundation to the future program. The members of the new commission have accepted their duties with enthusiasm and at their first meeting outlined most ambitious plans, which include, besides the installation of new playgrounds, neighborhood recreation centers and the organization of athletic and community activities, and a county-wide stimulation of interest in music, art and the sciences. Dramatic clubs will be organized in the various communities and a dramatic contest will be held in the spring. During the winter a training school is being conducted where play leaders may be trained for work, not only for summer playgrounds, but for all-year recreation. A County Art Guild is to be organized, with classes and sketching parties, with a county exhibit in the spring. In cooperation with the County Park Commission, which has been granted an appropriation of more than \$6,000,000 for the purchase of an extensive system of parks and parkways throughout the county, summer camps will be established for the boys and girls and the older people of the county.

And so it is hoped that Westchester County will open the way with a recreative program which has been tried and approved and which other counties in New York and other states may utilize for their own.

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Open Spaces and Road Frontages in Housing Projects---I

By F. Longstreth Thompson

Member, Town Planning Institute of Great Britain

THE provision of adequate open space is a fundamental requirement in any well-considered scheme of development. It is necessary in order to secure the amenity of surroundings that plays such an important part in the mental outlook and civic pride of the citizens; it is essential in order to provide the lungs that maintain the healthiness of the city; and it is indispensable to the enjoyment of open-air recreation.

The extent of the provision which may reasonably be made for open spaces in a housing project will depend upon the cost of the land, the size and character of the scheme, and the nature of its surroundings. For the type of development under consideration [one which makes provision for such requirements as community tennis courts, playgrounds for small children, and allotment gardens], it is usually desirable to reserve approximately 10 per cent of the total area of the site. Knowing the space available, it will then be possible to make use of it in the most suitable man-

ner, having regard to the needs of the case and the nature of the ground.

The question of the frontage occupied is a very important one. Road-making is an expensive item, and economy, without which, indeed, housing development is financially impossible, demands that no greater frontage should be occupied than is reasonably necessary, having regard to the character and purpose of the particular open space. Thus, beyond adequate means of access, open spaces such as allotment gardens, which have little or no decorative value, but, on the contrary, are apt to be rather untidy, do not require any road frontage at all, and are much more suitably placed upon land at the back of the houses. Many areas devoted solely to playing-fields may similarly be accommodated, although it is possible to make of them a distinctly decorative feature. But even where the object of the open space is partly or mainly decorative, it is not by any means necessary that it should be surrounded by roads. In the case of the vil-

lage green, which forms the social center of the neighborhood, the encircling road is an essential part of the arrangement, and cannot be dispensed with. But, ordinarily, it is quite possible to obtain the desired effect without incurring this expense. The plan illustrated in Fig. 1 is an excellent example of how a public garden can be treated in such a way as to fulfill its decorative function in the street picture and at the same time occupy very little road frontage. On a larger scale, a somewhat similar treatment has been used in the case

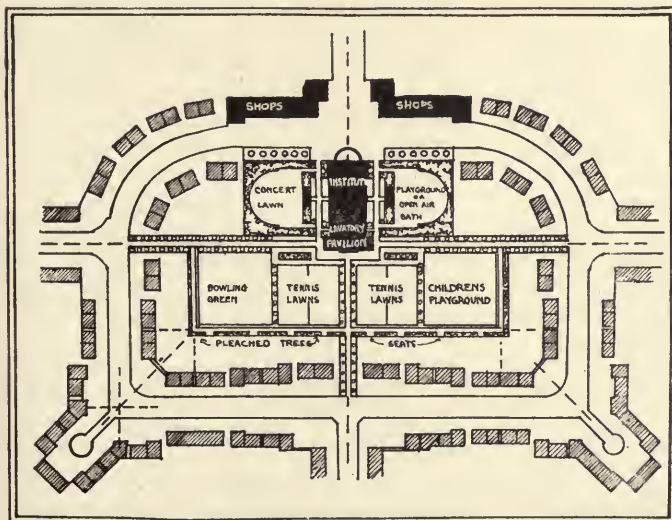


FIG. 1. SUGGESTED TREATMENT OF SMALL RECREATION GROUND

Reginald Dann, architect

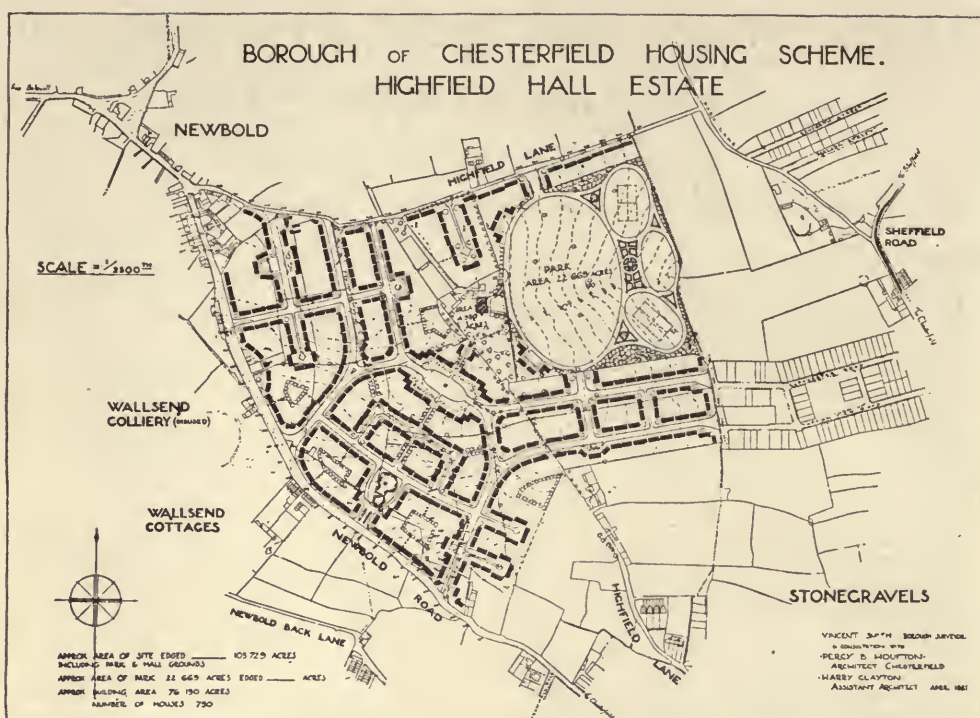


FIG. 2. LAYOUT OF HIGHFIELD HALL ESTATE, CHESTERFIELD, ENGLAND
Percy B. Houfton, architect

of the park shown upon the plan of the Chesterfield Highfield Hall Estate (Fig. 2), while amongst established instances the Rosenau at Nürnberg is particularly pleasing.

It must not be assumed that the stress which is here laid upon the desirability of limiting the frontage occupied by open spaces indicates any lack of appreciation of the beauty added to a street by an uninterrupted view over a park, so strikingly exemplified in the case of Birdcage Walk and St. James's Park. On the contrary, no one will dispute that where such treatment is possible it is extremely effective, but methods which are perfectly justifiable in planning the principal features of large towns are not necessarily applicable to the development of housing estates, where the strictest economy, consistent with reasonable amenity, is absolutely essential. In order to demonstrate the effect upon expenditure of different ways of treating an open space in regard to the frontage occupied, the three diagrams in Figs. 3, 4 and 5 are reproduced from an article in *Housing*. For purposes of comparison, it was assumed

that half the cost of the road upon which the open space abuts, amounted, with half the cost of the sewers, to £1 per lineal foot. It is possible that where a light carriage-way only is required and the footpath on the side adjacent to the open space can be dispensed with, the cost may be somewhat less, but in most cases it is likely to be more, so that the results err, probably, in the direction of an under-estimate. An open space having an area of 5.646 acres was taken in each example. In Fig. 3 it is shown entirely surrounded by roads, the half cost of which would be, upon the basis adopted, £2,260, or exactly double the value of the land occupied by the open space reckoned at £200 per acre.¹ In Fig. 4 the two longer sides of the park abut on back gardens, and only the short ends front on a road. By this arrangement the road costs are reduced to £600. In Fig. 5 the open space is placed entirely on back land, but at the entrances sufficiently wide openings are left to afford a fairly complete view of

¹ The average price of the land used for housing purposes under the Government Scheme, 1919-1922, was approximately £180 per acre.



FIG. 3. OPEN SPACE ENTIRELY SURROUNDED BY ROADS

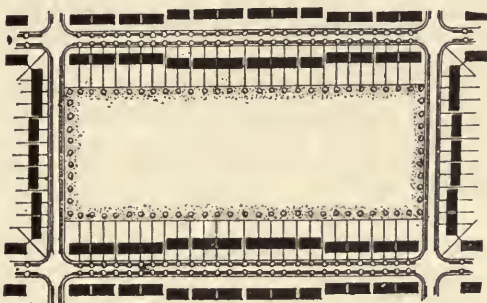


FIG. 4. OPEN SPACE OCCUPYING ROAD FRONTAGE ON TWO SIDES ONLY

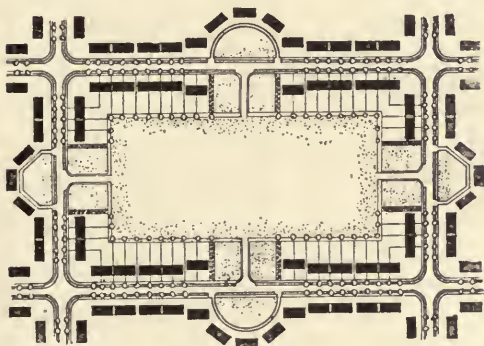


FIG. 5. OPEN SPACE OCCUPYING A MINIMUM OF ROAD FRONTAGE WITHOUT GREATLY SACRIFICING ITS DECORATIVE VALUE

it from each of the four roads. The cost of the road frontage in this case is £660, or approximately the same as in Fig. 4. A comparison between these results is best obtained by tabulating them in parallel columns.

TABLE I.—COMPARISON BETWEEN THE COST OF OPEN SPACES OCCUPYING DIFFERENT AMOUNTS OF ROAD FRONTAGE, AS SHOWN IN FIGS. 3, 4 AND 5. EACH AREA HAS 5.646 ACRES.

Arrangement	Cost of Land at £200 per Acre	Cost of Road Frontage at £1 per ft. in.	Total Cost of Land of Houses and Overlooking Roads	Number of Houses Open Space
Fig. 3.....	£1,130	£2,260	£3,390	80
Fig. 4.....	1,130	600	1,730	92
Fig. 5.....	1,130	660	1,790	112

It will be observed that in Fig. 3 the total cost of the open space is almost double that in 4 and 5, although the area is the same in each case; or, regarded in another way, the difference in cost is equivalent to the value of approximately 8 acres of additional land. Moreover, in spite of the fact that it occupies back land almost exclusively in 5 and very largely in 4, the number of houses which command a view over the park is considerably greater in the former, and slightly greater in the latter, arrangement than where it is completely surrounded by roads. When, therefore, there is only a limited sum of money available for the provision of open spaces, it is important to consider carefully whether the circumstances make it more worth while to secure a larger area with less frontage, or a smaller area with greater frontage. The general aim should be to obtain the maximum of decorative effect with the minimum of expenditure upon road charges.

While, however, the strictest economy in this direction is essential in the development of working-class areas, the same stringency is not so necessary in the laying out of estates for rather larger houses. In such schemes it will usually be found that the enhanced value of the building sites overlooking the open space will more than recoup the outlay on the road surrounding it.

Effect of Density on Road Planning

Arrangement.—The effect of density upon the planning of the minor roads is illustrated in Figs. 6 and 7. In these two diagrams a comparison is made between the development of two rectangular plots each 10 acres in extent, at densities of 12 and 20 houses to the acre respectively; both sites are assumed to be surrounded by roads 36 feet wide. In order to accommodate the requisite number of houses at the higher density, it becomes necessary to introduce two additional roads for the full length of the site; but at the lower density, the majority of the houses can be accommodated upon the four principal roads and a short subsidiary road only is necessary to provide frontage for the remainder. The actual length of frontage used in the two cases amounts to 6,265 feet for the 204 houses at a density of 20 to the acre, or an average of 30.71 feet per house; while only 3,214 feet are required for the 120

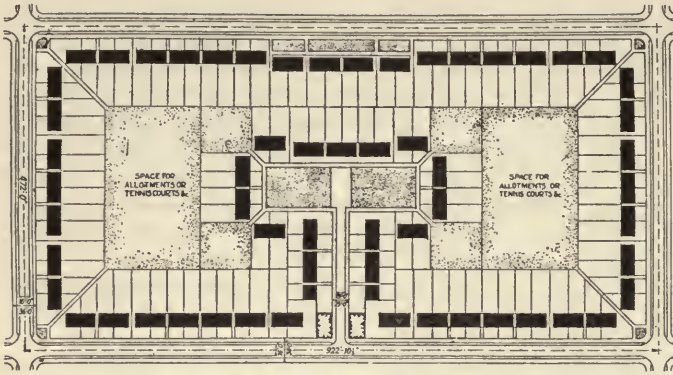


FIG. 6. DEVELOPMENT OF 10 ACRES OF LAND AT A DENSITY OF 12 HOUSES TO THE ACRE

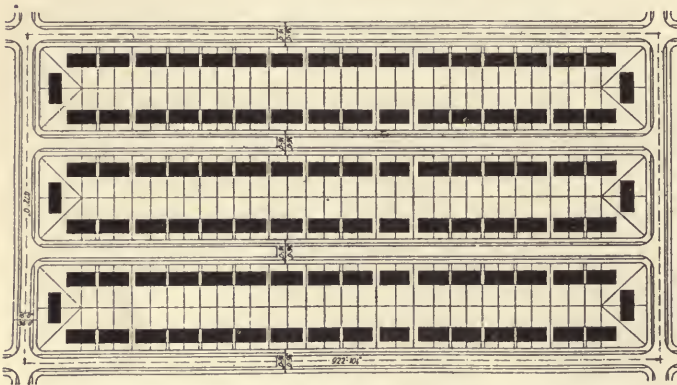


FIG. 7. DEVELOPMENT OF 10 ACRES OF LAND AT A DENSITY OF 20 HOUSES TO THE ACRE

houses at a density of 12 to the acre, or an average of 26.78 feet per house. Thus it will be seen that houses having exactly the same building frontage can be arranged to occupy less road frontage at a lower than at a higher density. In Figs. 6 and 7 there is a difference between the average road frontage and the average building frontage per house of 3.68 feet and 7.61 feet respectively. These figures represent the losses occasioned by road junctions and gaps between buildings, which do not occur in continuously built-up streets.

The proportion of gaps to houses in Figs. 6 and 7 is almost exactly the same, so that the economy in frontage obtained by the arrangement shown in Fig. 6 is due entirely to the saving effected on losses at road junctions. It will be observed that in Fig. 7 there are no less than 12 "convex" angles, whereas in Fig. 6 there are 8 "convex" and 4 "concave" angles. The effective number of "convex" angles in the lat-

ter case is thus reduced to 4, and this lower proportion of corners is responsible for the result obtained.

Cost.—But the economy of such an arrangement is not measured merely by the actual length of frontage saved, because, as nothing but the lightest traffic will have to be carried by the cul-de-sac, a narrower width and lighter construction can be used for this road than would be possible in the case of the subsidiary road in Fig. 7.

It will be noted from the accompanying table that at the cost of land and road and sewer construction current during the period of the Government Housing Scheme, the total expenditure per house plot for land and development charges is slightly less at the lower density than at the higher density, although the net

area of the plot in the former case is more than double that of the plot in the latter.

Comparative tables of this kind usually show that increased density results in a slightly reduced total cost per plot. This is attributable to two causes. Pre-war comparisons were based upon conditions under which the cost of the land was a much

Total area of site	Acres	10	10
Area occupied by roads	"	1.35	2.59
Net area of site	"	8.65	7.41
Number of houses	"	120	204
Gross density per acre	"	12	20.4
Net density	"	13.87	27.52
Average net area of house plot	Square yards	350	176
Average net building frontage per house	Feet	23.1	23.1
Average road frontage per house: Total	"	26.78	30.71
36 ft. road	"	22.65	30.71
Light road	"	4.13	—
Cost of roads and sewers per house	£ s. d.	43 5 0	52 5 0
36 ft. road @ £1 14s. od. per foot frontage	"	38 10 0	52 5 0
Light road @ £1 3s. od. " "	"	4 15 0	—
Cost of land per house @ £180 per acre	"	15 0 0	8 10 6
Cost of land and development per house	"	58 5 0	61 1 6
Cost of house plot per square yard net	"	0 3 6 1/2	0 6 11 1/2

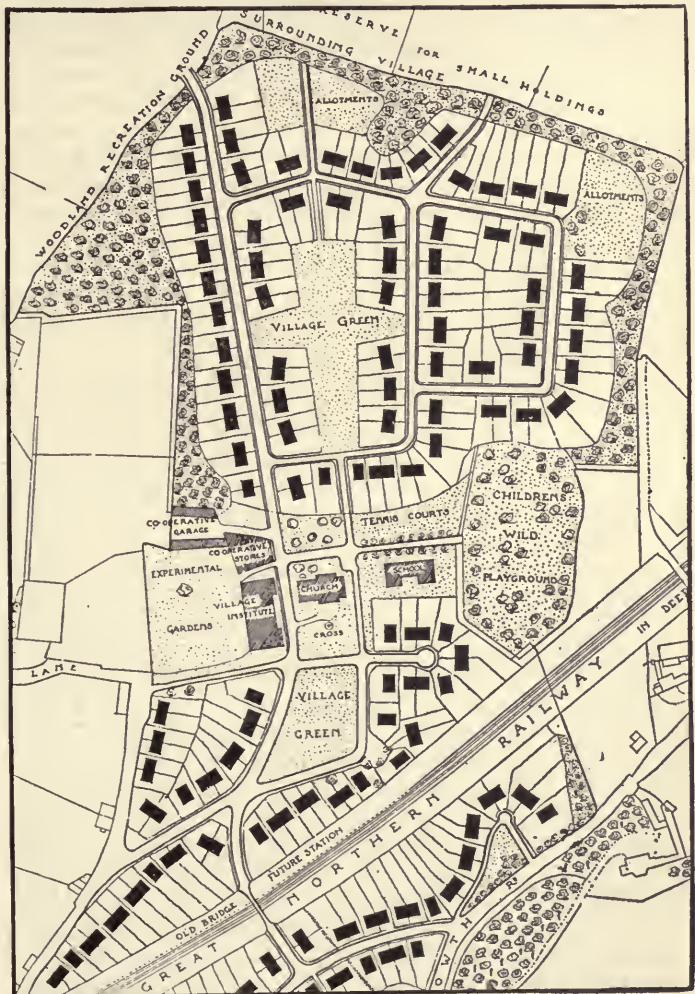
TABLE II. COMPARATIVE STATISTICS OF DEVELOPMENT OF TWO PLOTS OF 10 ACRES EACH AT DENSITIES OF 12 AND 20.4 HOUSES TO THE ACRE, RESPECTIVELY
Costs are given in English currency

more important item in the cost of the developed house plot than it is to-day. It was usual to assume a price of £300 per acre for land, and at this rate the cost of the land represented 50 per cent of the total cost in the case of a density of 12 to the acre, and 33 per cent in the case of a density of 20 to the acre. But as the average cost of the land has been in the neighborhood of £180 per acre, or only 60 per cent of the pre-war assumption, while the cost of roads and sewers has at least doubled, the proportion borne by the cost of the land to the total cost of the plot is now reduced to 23 per cent and 15 per cent respectively. Hence any system which economizes in road making has a great advantage, and a reasonable generosity in the use of land is compensated by an equivalent saving in the cost of road and sewerage works.

The other factor which influences the result is the question of building frontage. It has been usual to assume much wider frontages in the case of the low density than in the high. This does not afford a fair comparison, because within reasonable limits, both of frontage and density, the two matters are independent, and there is no reason why houses having the same frontage should not be used in the one case as in the other. However, without laboring the point further, it will be clear that if any value is attached to the greater area of land which is available both for increasing the size of the individual plots and for use as tennis grounds and other communal purposes, development at 12 houses to the acre is much more economical than at a

higher density, because the benefit of the extra land is obtained at almost exactly the same cost. It will also be clear that if the reduced density is adopted—as it has been throughout the Government Housing Scheme—a type of development is required which is economical in development charges and makes the utmost legitimate use of light roads and culs-de-sac.

ACKNOWLEDGMENT.—Reprinted by permission of the Oxford University Press, American Branch, New York, from portions of chapters VI and VIII of the author's new book on "Site Planning in Practice." A section on Subdivision of Land into Building Blocks will follow in an early issue. F. Longstreth Thompson, B.Sc. (Eng., Lond.), the author of this valuable book, is Chadwick Gold Medallist in Municipal Engineering (Univ. Coll., Lon.); Assoc. M. Inst. C. E.; Member Town Planning Institute. There is a Foreword by Raymond Unwin, F.R.I.B.A., Chief Architect, Housing Department, Ministry of Health.



LAYOUT OF KILLESTRE HOUSING SCHEME NEAR DUBLIN, IRELAND, SHOWING RESERVATION OF WOODLAND BELT AROUND VILLAGE

The Trackless Trolley

How It Works—Its Advantages Compared with Street Railway and Bus

By Grover A. Whalen

Commissioner of Plants and Structures, New York City

THE trackless trolley is a vehicle operating on the road surface and driven by electric motors which are supplied with electrical energy from two overhead trolley wires. This is in contradistinction to the ordinary trolley car, which is supplied with electric current from overhead wire, with the return thereof to the power-house via the track and the earth; hence the term "trackless trolley" is employed to describe this newer type of vehicle.

The trackless trolley *per se* is not essentially new; it was employed as an experimental device in Colorado as early as 1897 and has been used to a small degree in England and Germany within recent years. The most extensive use of the trackless trolley, however, is on Staten Island, borough of Richmond, city of New York, under the direction of the Department of Plant and Structures.

Staten Island is very poorly provided with transportation facilities, the interior having practically no means other than horse-drawn vehicles or automobiles. In the spring of 1921 the attention of the Commissioner of Plant and Structures was called to the fact that Linoleumville on the west shore of the Island was nearly three miles from the nearest trolley terminal and that Seaview Hospital, operated by the city of New York, was about 1.75 miles from the nearest trolley terminal. The bus drivers who covered this territory charged excessive fares, and the city emergency bus service was not allowed by the courts.

After a careful study of this problem, it was decided that a trackless trolley extension of the Midlands trolley line, operated by the city of New York, would afford the best solution. Accordingly the Meiers Corners-Linoleumville and the Meiers Corners-Seaview Hospital lines were constructed. They were opened to the public in October, 1921. Meiers Corners is the point at which the two lines connect through the agency of a loop. An incom-

ing and an outgoing line were constructed on Richmond Turnpike, connecting the first-mentioned localities, and a single line was constructed between the loop and Seaview Hospital.

The overhead construction of a trackless trolley line is very similar to that of the ordinary trolley system, except that each line is composed of two wires placed from 14 to 18 inches between centers. A double trolley pole or two trolley poles are mounted on the roof of the car, and conductors are led from the two contact members at the top of the trolley pole or poles to the ordinary car controller and thence to the motors. When operating on a double line, such as that to Linoleumville, cars are operated as any ordinary trolley car, excepting that, since they are not fixed in position as regards travel, they can swing around obstructing traffic or pull up to the curb to allow passengers to enter or leave the car.

When cars traveling in opposite directions pass each other on a single line, one car pulls out of the way, its trolley pole is lowered to allow the other car to pass, and is then replaced on the line when the car has a clear way. No sidings are necessary. This procedure is followed on the Meiers Corners-Seaview Hospital Line.

The trackless trolley car as used on these original city lines is shown in Fig. 1. This is known as the Atlas trackless trolley and is arranged to seat thirty-two passengers and carry a maximum of seventy. This photograph also shows the construction of the loop at Meiers Corners and the method of supporting the two trolley wires.

The wooden pole which is mounted on the roof has two sliding contacts which press against the trolley wires. The conductors that connect these contacts with the controller and the motors are carried down the pole along the roof of the car through a pipe to the controller, and from thence to the motors. The motors are series



FIG. 1. TRACKLESS TROLLEY CAR USED ON ORIGINAL CITY LINES ON STATEN ISLAND, NEW YORK

wound and of 25 h.p. each, connected together mechanically by means of a propeller shaft which extends to a worm gear to drive the rear wheels. The wheels of the car are 36 inches in diameter and of the cushioned rim, cushioned tire type. The car control is like that of an ordinary trolley car. The efficient running speeds are 17 and 25 miles per hour respectively, with series and parallel electrical connection of the motors.

These initial lines passed through the severe winter of 1921-22 without an interruption of traffic, even though all other means of transportation on the island were frequently interrupted on account of snow or sleet. In fact, service was so satisfactory that when the residents of Tottenville, at the southwesterly tip of Staten Island, expressed a desire for a cheap method of travel to the city ferries at St. George, by means of which connection is made with Manhattan, it was decided to extend the St. George-Richmond division of the Midlands lines (city-operated) to Tottenville by means of a trackless trolley. The distance from Richmond

to Tottenville is approximately ten miles.

Construction of an inbound and an outbound line on Arthur Kills Road, the connecting highway, was started in the early summer of 1922, and the line was opened November 4 of that year. The line construction is the same type as that employed in the earlier trackless trolley systems on the island. Power is obtained from an alternating-current power-plant located at Seaview Hospital and converted to 600 volts direct current in an automatic substation near Fresh Kills Bridge

and Arthur Kills Road.

The first trackless trolleys purchased by the city had unnecessarily high road clearances and too narrow wheel treads, and were somewhat uncomfortable on account of a side swinging motion. The Engineers of the Department of Plant and Structures studied the problem and evolved a trackless trolley bus which has a much smaller road clearance, so that only one step is needed for car entrance. It has a much wider wheel tread, eliminating side motion, and a long wheel-base, giving greater comfort in riding and an improved appearance. The vehicle power-plant and general



FIG. 2. NEW TYPE OF TRACKLESS TROLLEY CAR IN USE ON STATEN ISLAND

means for operation were not altered, as these proved very satisfactory in the original cars. The new type of car is shown in Fig. 2. These vehicles were built by the Brockway Motor Corporation and have given satisfaction.

A question commonly asked is, "What are the advantages of the trackless trolley over the gasoline bus?" The answer is definite: it costs 25.6 cents per mile to operate the trackless trolley over the roads on Staten Island, and it costs about 33 cents per bus-mile to operate a gasoline bus of the same capacity over the same roads. This cost includes every item, such as interest on first cost of the entire investment, depreciation and maintenance, power for operation, labor for operation, administration, etc. Another answer to the question is the psychological effect. The general public has learned that while a bus line may be operating to feed some real estate development, there is no assurance that this bus line will continue after the property of the development scheme has been sold; in fact, the public has learned the contrary. The trackless trolley, employing a relatively expensive overhead construction, conveys the assurance that this transporta-

tion is of a permanent nature. Therefore, people are more prepared to buy property along highways on which trackless trolleys operate than along those upon which the uncertain bus routes obtain, and this increases the value of the property and its tax return.

Another question which is quite frequently asked is, "What are the advantages over the ordinary trolley systems?" The answer to this is: the trackless trolley requires no expensive track construction, which at the present time for the ordinary trolley may vary from \$40,000 to \$200,000 per mile, depending upon the territory through which the trolley system is to operate and the type of track construction required. The absence of this track construction naturally reduces the first cost of installation very markedly and, therefore, the fixed charges. The second advantage is the flexibility of the trackless trolley car in that it can pass around obstructing traffic or pull up to the curb to allow passengers to enter or leave, thus eliminating the dangerous walk from the curb to the middle of the street, or the converse, which obtains under present high-speed automobile travel.

Home Ownership versus Paternalism

MANY a great corporation with a strike on its hands has cried aloud the ingratitude of its employees.

They have a "model village." Each modern cottage has all conveniences, plus gardens and lawns. Rent is nominal. For social life there are churches, schools, kindergartens, day nurseries, community centers, welfare workers, moving pictures. There is opportunity for self-improvement in general culture or technical efficiency. Happiness is so easy that discontent were a sin!

Yet frequently it is precisely this managerial provision that affords the irritant. The house is the company's. The pastor is paid by the mill. The children learn in company schools. Amusements are tinged with industrial censorship.

All these things, in theory a sympathetic bond between employee and industry, too often have the feel of shackles. Real democracy strikes root deeper than wages and working conditions. Industry and politics may play the paternal to the point of substituting for Providence, and yet fail to convince the American individualist. The feudal baron held his serfs to the land by force; the qualities of ease, luxury and convenience are only disguises of a like compulsion.

In North Carolina are two industrial communities illustrating the contrast between a

well-meaning error and a promise of a true democracy of labor.

In the one case the worker lives in an apartment house environment of domestic, educational, social and spiritual super-service; but whenever he raises his eyes he sees on a commanding hill the huge mansion of the executive head of the great hive in which he has his cell—a sign as definitely possessive as any medieval castle frowning down upon the manor.

In the other case also there is a great mill, a village, and community accessories. But here the workers have home ownership as a goal, under a plan by which the purchase price is saved out of earnings. In this case also there is a great executive, but he has no mansion so placed that its white walls emphasize to the village dwellers the superior estate of one whose wealth has summoned the duty of their hands.

In the one case a strike might have as a palliative of its hardships the stimulating assertion of independence; in the other it would mean the tremendous sacrifice of true homes.

Subject to reasonable ambition, every man should be tied to his job; but whether the harness galls depends upon the destination of the load.

—From *Natural Resources*, the bi-weekly Publication of the North Carolina Geological and Economic Survey.

Delivering Municipal Electric Power to Rural Communities

A Description of the Rural Distributing System of the Hydro-Electric Power Commission of Ontario

By A. G. Lang

Distribution Engineer, Hydro-Electric Power Commission of Ontario

THE rural distributing circuit of the Hydro-Electric Power Commission of Ontario is carried on the poles of the urban system from the Commission's substation to the urban limits. From this point the construction is of a strictly rural character; excepting only when use is made of poles of suitable existing lines, such as those carrying the high-tension circuits of substations, whenever such lines are available. Where the number of consumers is small it may be advisable to extend the urban circuits, rather than to construct a separate feeder from the substation.

The standard circuit for primary distribution is 2,300 volts, single-phase, with one leg of the circuit grounded. At or near the consumer's premises, this is stepped down by a service transformer to 220 or 110 volts, single-phase. Usually, for economy of distribution, the circuit is made three-phase, 4,000/2,300-volts from the substation to a load center in the district, and numerous branch lines of single-phase, 2,300-volt circuit are tapped off from the three-phase circuit. The single-phase circuits constitute by far the greater mileage, and the standard service given to the consumer is single-phase. Three-phase service is given only to consumers with exceptionally large loads. On account of the small load density per length of line, it is necessary to install a type of construction of low capital cost, in order to reduce the cost of power to a point at which it will be attractive to the rural consumers. At the same time, the rural consumers will not be content with the quality of service in operation inferior to that supplied in urban municipalities.

How Costs Are Kept Low

To obtain minimum costs, local labor is used wherever such can be secured, and occasionally poles are obtainable in the vicin-



THE RESULT OF A SLEET STORM ON A RURAL ELECTRIC LINE CARRIED ON POLES

ity. On practically all proposed lines, tenders are obtained and, if satisfactory offers are received, the work is done by contract.

In making a survey for the location of a line along a rural highway, it will usually be found that a telephone line is already occupying one side of the highway and, as might be expected, this line has taken the most desirable location, even to the extent of jogging across the road at intervals, to avoid trees. The second choice of location must then be accepted. Frequently, however, two lines of telephone poles, one on either side of the road, will be encountered, necessitating either the overbuilding of one of the telephone lines by the power line, or an arrangement for the joint use of



PREPARING AND BACKFILLING THE TRENCH FOR UNDERGROUND POWER CABLE

poles for telephone and power circuits.

Overhead Lines

For overhead lines, the standard pole used to carry the 4,000- or 2,300-volt circuits is 30 feet in length, of eastern cedar, with 6-inch diameter at the top. These poles are set in the ground to a depth of 5 feet 6 inches. Poles of greater height are occasionally required to provide clearance from trees and foreign pole lines. At railway crossings, poles of top diameter not less than 7 inches are necessary, and of sufficient height to permit a clearance of 30 feet between the rails and the conductors for the 2,300-volt circuit. The maximum space between poles on the rural power line is 160 feet, and the space is commonly obtained, but it is reduced at curves in the road and at corners and by other obstacles, so that the average spacing may be considerably less than 160 feet.

The standard conductor is No. 6 B. & S. gage bare hard-drawn copper for the 4,000- and 2,300-volt circuits. For the 4,000/2,300-volt, three-phase circuit the conductors are supported on four-pin dressed fir cross-arms of cross-section $3\frac{3}{4} \times 4\frac{3}{4}$ inches and 6 feet 4 inches in length. This length provides a climbing space of 30 inches, with 18 inches between the outer and adjacent conductors. The cross-arm is secured to the pole by a $\frac{5}{8}$ -inch machine bolt and by two flat steel braces, 30 inches in length. All hardware is galvanized. Cross-arms are not used for the 2,300-volt

single-phase circuit, the phase or ungrounded conductor being carried on a steel pin projecting above the top of the pole, and the grounded conductor on a steel bracket on the side of the pole, with 2 feet vertical separation between the two conductors. Porcelain insulators are used for all wires of the primary circuit, except the grounded conductor, where glass insulators are used.

The service transformers are identical with those used in urban systems, except that a low exciting current is essential, as for rural districts the ratio of demand on the feeder to connected kilovolt-amperes in transformers is very low. Isolated transformers are the rule; that is, one transformer for each consumer. In small towns, however, and wherever farm services are close together, one transformer is arranged to feed, as far as economical, over the 220- or 110-volt secondary circuits.

Underground Construction

In 1921, because of the great increase in cost of labor and material, the Commission's engineers investigated the possibilities of underground construction in rural districts. The use of cables laid underground is, of course, a well-established practice and, in fact, antedated the use of pole lines. The application of underground cables to the rural service is, however, quite new, and the methods of installation and the details of design were given considerable study. To date, a total length of 150

miles of cable has been laid underground and is operating successfully.

The standard cable consists of a single conductor, No. 6 B. & S. gage, 7-strand copper, insulated with 30 per cent Para rubber, 3/32-inch in thickness, laid over with a rubber-filled insulating tape and covered over-all with a pure lead sheath 1/16-inch thick, and it is furnished in uniform lengths of 1/2-mile each. The cable is laid in a trench at a depth of from 12 to 18 inches and is not protected by a duct or covering other than the refilled soil, except at hazardous locations, such as road crossings, where a creosoted plank is placed above the cable after a few inches of excavated soil has been placed.

The trench is made by a grading plow of exceptional strength drawn by a tractor. The plow is designed to turn a furrow 18 inches in depth. It is fitted with a heavy coulter, which readily cuts through tree roots 4 inches in diameter. The tractor is also used to draw a carriage, on which the cable reel is mounted and from which the cable is laid in the trench with a minimum of handling, and also a scraper for refilling the trench. Cable joints are enclosed in lead sleeves, compound-filled, and sealed with wiped joints to the cable sheath.

At points where service to the consumer is required, a wood pole is set and the cable is carried up the pole, terminating in a disconnecting pothead. Continuing the circuit along the highway, the cable is carried down the pole again from a second pothead. This method eliminates the neces-

sity of a joint at the foot of the pole, and the disconnecting potheads form a convenient means of opening the circuit for tests or other purposes. The potheads are installed with wiped joints. The cable on the side of the pole is protected by a metal molding. On this pole the service transformer is mounted, and the secondary service wires are usually run overhead to the consumer's premises.

In operation, the cable, up to this date, has proved quite satisfactory. Occasional faults have developed, but comparatively few, considering the total mileage in operation. Novel methods have been devised for finding faults, and the location and repair of them is now accomplished quickly and satisfactorily. This type of construction is not expected to supplant entirely the use of overhead construction, and local conditions will govern the Commission in making the choice between the two types.

Under the conditions favorable to the installation of the cable, the capital cost per mile will be less than for overhead lines. This applies to single-phase circuits only, where, in general, the lead sheath is used as the grounded conductor of the circuit. Except under conditions extremely unfavorable to overhead construction, the cost of laying three-phase circuits underground will exceed the cost of similar circuits overhead. It is expected, however, that the cost of maintenance and operation and the rate of depreciation will be decidedly in favor of the underground system.



TYPICAL OVERHEAD AND UNDERGROUND INSTALLATIONS OF CABLES, SHOWING ADVANTAGES OF THE LATTER SYSTEM

Ill-regulated City Growth in the "Good Old Days"

TO those who place the Golden Age of the world in the period of "the grandeur that was Rome," or who sigh for the good old days of mid-Victorian England, the following paragraphs are respectfully commended. They are from the recently published English work "Towns and Town-Planning, Ancient and Modern," by T. H. Hughes and E. A. C. Lamborn, handled in America by the Oxford University Press, American Branch, New York.

When Rome Was in Its Glory

"Though the civic consciousness of the Romans in matters esthetic was more highly developed than our own, and its evidences remain for our example, particularly in the provincial cities, there are pictures in Juvenal and Martial which might have warned our statesmen in the nineteenth century of the dangers and miseries attendant on the ill-regulated growth of wealth and population. Although the problem of planning for a rapidly increasing population is mainly modern, it presented itself in Rome and found the Romans little better prepared than ourselves to meet it with prevision and adequate measures. The rich had parks and gardens within and around the city, which checked its natural expansion in a way which has its parallels in modern England. The State trusted to contractors to meet the problem of housing, and allowed them to disregard the old building laws and to run up jerry-built houses of timber to enormous heights in narrow streets intended for buildings of a single story.

"The annual rent of a garret in one of these tenements would have purchased the freehold of a country cottage; and its occupier was exposed to two ever-present dangers, the collapse of the house from jerry-building or earthquake and its destruction by fire. The wealthy kept private fire-brigades of slaves to safeguard their premises (though the custom of collecting subscriptions from your friends when your house was burnt down often made a fire actually profitable to the well-to-do), and

there were at least seven fire stations in the city with brigades in constant readiness for duty.

"The inconvenience and danger was equally great for the public; the great beams that shored up decrepit houses projected into the narrow streets and made traffic difficult and dangerous, so that wheeled carriages were forbidden during the day in many quarters of the city, though the rich man in his litter rode safely above the heads of the throng. Loose tiles falling from the high roofs sometimes smashed the hard pavement and sometimes the skull of a passer-by. Signs hung out over tavern doors, and tables projecting from tradesmen's shops added to the congestion. The narrowest parts of the thoroughfares and, especially, the bridges where traffic was slowed or halted were the haunts of beggars who were thus enabled to force their solicitations upon the passers-by. At night the noise of heavy traffic in the narrow streets made sleep impossible, even though the windows were heavily shuttered; but to venture out of doors was to take the risk of being robbed by foot-pads or assaulted by mohocks or run down by a passing vehicle, for the streets were unlighted and only the rich with their body-guard of slaves or clients carrying torches were safe from the perils of the night. Antioch and Ephesus alone of ancient cities seem to have had a communal system of street lighting.

London and Glasgow in the Last Century

"So Miss Octavia Hill's 'Homes of the London Poor' makes it clear that overcrowding in London and Glasgow had gone from bad to worse. 'We perpetually find in crowded parts of London blocks of houses built after this fashion: we have, first of all, a square of larger houses facing four streets. These once had gardens, yards, or spaces at the back; but as land became more valuable these have been built over, usually with much lower houses, to which access is gained by a narrow passage from one or more of the thoroughfares, sometimes open to the sky, sometimes a mere tunnel

under the house.' In Glasgow 'the unhealthiness and overcrowding must, I think, have been even worse than in London. The "wynds," as they call them there, were at least as narrow as the London courts. Like them, they were often blocked up at one end, so as completely to stop the free passage of air. But I saw there what I have seldom or never seen in London—a perfect honeycomb or maze of buildings, where, to reach the "wynd" furthest from the street, one had to pass under archway after archway built under the houses, and leading from one squalid court into another. . . . The houses, too, were higher than is usual in London alleys, and the darkness and obscurity consequently greater. . . . Here and there, running up between house and house, were narrow crevices, from six to twelve inches wide, and from these the back rooms in some houses drew their only light. . . . They represented spaces once occupied by garden walls. . . .

When the habits of the people were dirty, and they threw things out of the windows, these "dreepings," being far too narrow to be cleansed in any way, became receptacles where every kind of fever-breeding substance must gradually have decayed, carrying disease in every breath of air.' In such an environment thousands now living were born.

"Well might Ruskin 'wonder what the angelic builders and surveyors—the angelic builders who build the many mansions up above there; and the angelic surveyors who measure that four-square city with their measuring reeds—wonder what they think, or are supposed to think, of the laying out of grounds by this nation, which has set itself, as it seems, literally to accomplish, word for word, or rather fact for fact, in the persons of these poor whom its Master left to represent Him, what that Master said of Himself—that foxes and birds had homes, but He had none.'"

Does Beauty Pay?

By Edward F. Brown

Executive Director, Community Arts Association of Santa Barbara, Calif.

IT would be a shock to the purist in esthetics to read the title of this article. Whether beauty pays or not is beside the point. Beauty is its own justification and needs no conventional financial balance sheet. But one of the by-products of the efforts being made in Santa Barbara, Calif., to beautify the city is the demonstration that *beauty does pay*, and pays handsomely.

The prospective house builder with moderate means is confronted with what he may believe to be a fact—that a meager purse is a bar to a beautiful effect in house building. The Plans Division of the Community Arts Association of Santa Barbara is answering that supposition in a very practical way.

A few months ago there opened in Santa Barbara an exhibition of designs of houses costing \$5,000. Ninety-two designs were submitted in an open competition, and \$1,000 in prizes awarded. The entries came from all over the country, the majority, however, from California, since the subject

was a dwelling house suitable for California, of not over five rooms, including living-room, dining-room, kitchen, two bedrooms and bath, placed on an inside lot 50 feet wide upon the street and building line, and 150 feet deep, without an alley in the rear; also a garage for one car, which may or may not be separate from the house and may be placed anywhere upon the lot. The drawings were all accompanied by bonafide estimates from builders, indicating the cost, a sum which was to cover all painting and decorating, including walks and drives, but not gardening or planting, and not to exceed \$5,000.

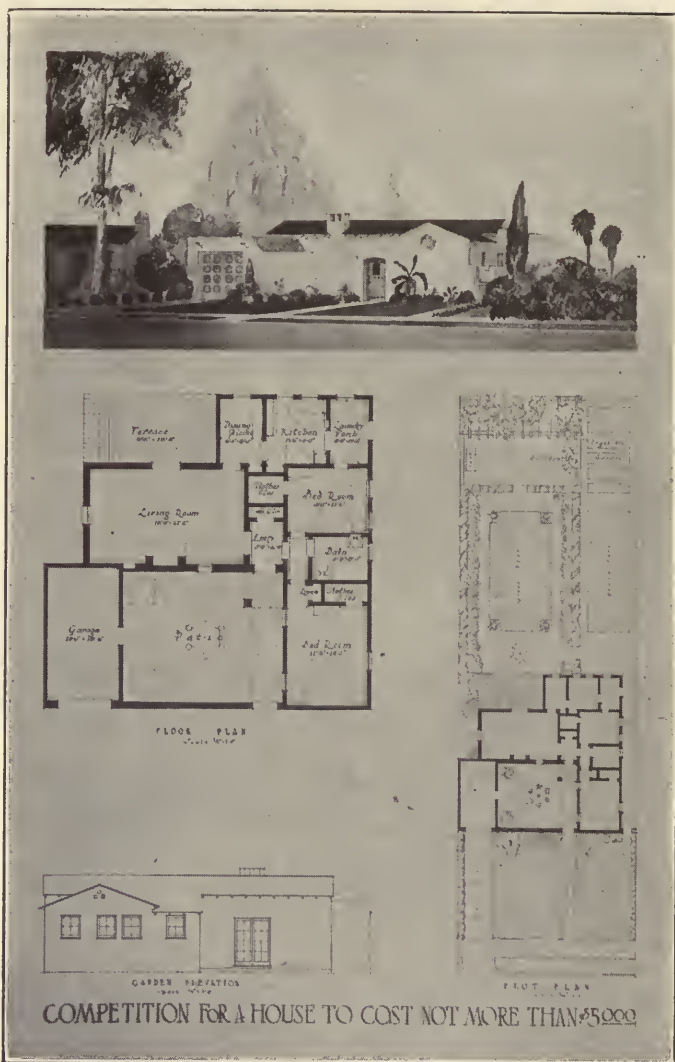
The judges of the competition were: Carleton M. Winslow, consultant; Pierpont Davis, Jesse Stanton and Sumner Spaulding, the last three selected by the Architectural Club of Los Angeles, and Mrs. George Washington Smith and Daniel Kirkhuff, lay members; residents of Santa Barbara. The winners of the first, second and third prizes were Walter L. Moody, A. McSweeney and Leffler B. Miller. After

the awards, the designs were placed on exhibition at the Paseo Dela Guerra, itself a beautiful example of native architecture.

Plans are now under way by the Plans Division to arrange with the architects who submitted designs to sell the working drawings of these designs at a moderate fee. This arrangement is based on the belief that the person with \$5,000 to spend for a house does not usually consult an architect. The Plans Committee will protect the architects against major modifications, especially exteriors, by arranging for the sale of the working drawings in Santa Barbara on condition that no changes in exterior be made without the consent of the Architectural Advisory Committee of the Community Arts Association, which comprises a group of competent architects.

It is the further purpose of the Community Arts Association to publish in book form fifty or more of the most creditable of the designs, with comments by competent architects, so that the strong points of each design may be emphasized and the weak points guarded against. The Association will sell this book at a moderate fee to counteract the deleterious effect of the less desirable of the "Bungalow Books." In this way the householder with a moderate amount available

for a house will be in a position to choose from a wide selection and be assured that the design has been the subject of examination by a competent and unprejudiced expert.



PLAN WHICH WON FIRST PRIZE IN THE SANTA BARBARA COMPETITION ON DESIGNS FOR SMALL HOUSES

By Walter L. Moody, of Santa Monica, Calif.

Our city government is in our own hands. It is as good as we deserve, for it is as good as we care to make it.—*Lyman Abbott.*

Real Street Flushing

By J. W. Morris

Former Deputy Commissioner, Division of Streets, Cleveland, Ohio

THIS article describes primarily the manner of street flushing in vogue in the city of Cleveland for the past year and not so much the personnel, hours on service, number of men employed and the cost. From the writer's observation in many of the large municipalities of the United States, much, if not all, of the street flushing should be properly denominated "four-flushing."



FLUSHERS CLEANING CENTER OF ROADWAY, DIRECTING STREAM TOWARD GUTTER

What Is Real Flushing?

Real flushing consists not in merely displacing the accumulation from the crown of the road to the curb, but in removing it entirely through the regular sewer-mains.

When flushing as now practised in Cleveland was first proposed, many predicted that our catch-basins would be blocked and the savings effected in flushing would be offset by the additional cost of cleaning the basins, but this has proved not to be the case. The fact of the matter is that there were not as many basins reported blocked

under the new system of flushing as there were after a heavy rain. All through the season, there were never more than five catch-basins reported as not taking water.

The new method of flushing has far exceeded our earlier expectations, not only as regards the cost, but also in respect to the efficiency of the system and its sanitary application.

Real Flushing a Saving

With our present arrangement, it is no longer necessary to employ as many pick-up crews as formerly to clean the curb, or as many trucks and teams to haul the refuse away to convenient dumps, because the accumulation is carried off in a natural way through the catch-basins. Not only has the new way of flushing eliminated dust and the consequent annoyance and damage to householders and storekeepers, but it has proved its efficiency in making it possible to clean more miles of streets and with greater regularity than ever before.

Every residential street



FLUSHERS OPERATING IN THE GUTTERS, WASHING REFUSE INTO CATCH-BASINS



CLOSE-UP OF FLUSHER WORKING IN GUTTER

in the better districts was flushed at least every two weeks, and in the more congested centers as often as once a week. Special attention was paid to the poorer districts, for the reason that much of the disease prevalent in a city originates from these districts, affecting every other part by the personal contact of the residents of the poorer sections with others of more favored parts in association on street cars and in public buildings.

The sanitary aspect of this matter, in the writer's judgment, transcends every other consideration, even if the cost of the system is found to be considerably in excess of the cost of the usual method.

Putting the Plan into Operation

Before explaining the *modus operandi* of the new method of street flushing, I

might say that it is necessary to remove the winter's accumulation from the streets by the old shovel-and-broom process before putting into operation the plan suggested. After this is done, the plan can be followed until the weather makes it impractical to throw water upon the streets.

The South Bend type of flusher is in use in the city of Cleveland, and most of these machines are mounted on White chassis. These flushers are operated in batteries of two, as shown by the accompanying illustrations.

One of the machines proceeds down the crown of the road, with the nozzles set as shown in the first illustration, the other machine following with the nozzles set as shown in the second picture. The third photograph illustrates the same operation and gives a better view of the accumulation flowing toward the catch-basin. The first flusher throws all of the refuse from the crown of the street toward the curb, and the second flusher carries the refuse along to the basin. Care should be observed in setting the nozzles on the rear machine, so that the water will not flow over the tree lawn and, as a result, bring a backwash of dirt into the curb.

In sections of the city where there is a declivity in the pavement, the flushers work from the top of the hill on both sides of the street and use a less pressure of water to carry the accumulation to the catch-basin. Most of our flushing is done at night, particularly in the immediate down-town section, and one of the first noticeable results of the new system was that the white wings had very little to do, other than pick up newspapers scattered promiscuously by newsboys.

The system has proved efficient, economical and sanitary: efficient in that it removes all of the accumulation from the street; economical in that it will displace more than half of the white wings and pick-up crews; and sanitary in that it eliminates dust and minimizes the danger of disease.

JUVENILE DELINQUENCY WHERE PLAYGROUNDS ARE LACKING

We have found in our city that juvenile delinquency occurs most frequently where playgrounds are lacking. A careful platting of the records shows that in almost every case in wards where playgrounds are few, the peak of delinquency is highest, dropping down in a marked degree where a sufficient play space is provided. Juvenile court records show that in one case, covering a period of three years, delinquency was reduced more than 67 per cent after the opening of a playground in that neighborhood. Such evidence as this seems to prove—in fact, does prove—that money expended in playgrounds will make many returns on the original investment, in so far as it helps not only to prevent wrong-doing, but also to create a better class of citizens.

—From an address by C. H. Meeds, Chief Engineer and Executive Officer, Park Department, Cincinnati, Ohio, before the recent annual convention of the American Institute of Park Executives.

Modern Construction of Brick Pavements

By Will P. Blair

Vice-President, National Paving Brick Manufacturers Association

AT the 1919 meeting of the American Society for Municipal Improvements, stress was laid on the lack of information as to the conditions of subgrades upon which we lay the wearing surfaces of our streets and roads. Soon afterwards, the Federal Highway Council appointed a committee to study the natural influences involved in the subgrade and its relation to road surfacing and traffic. One of the principal discoveries of this committee was that the subgrades of most soils throughout the country were subject to contraction and expansion, due to the influence of water. It was found that the forces of expansion of a saturated subgrade were of extraordinary power, often resulting in the destruction of rigid surfaces, such as cement-filled brick roads, which hitherto had been approved by the industry.

As soon as this fact was established and information gathered as to other agencies of destruction, it became perfectly apparent that the construction of brick wearing surfaces would have to be changed, in order to meet the destructive agencies more satisfactorily. In the meantime, the manufacturers of vitrified brick, through their local organization, the Western Paving Brick Manufacturers' Association, had discovered and utilized a certain refined asphalt, which had the quality of maintaining its place in the brick joint under extreme high temperature and did not become rigid and fragile under the influences of low temperature. Experience with this filler covering a period of about eight years demonstrated its extraordinary merit.

It was at once recognized in view of the newly discovered agencies of destruction of rigid pavements that by using this kind of asphalt as a filler, sufficient flexibility of pavement would be secured so that these forces operating with an upward thrust against the brick surface would have little injurious effect. It was proved by experience that this filler practically protected the edges of the bricks fully as well as the

cement filler. In the light of this knowledge, there was but one thing to do and that was to strongly recommend to engineers and the public the use of this particular refined asphalt as filler for brick pavements, as affording a pavement subject to the least possible injury, either from traffic or from natural agencies.

It must be understood that the use of asphalt filler in no way obviates the necessity of carefully complying with the details of construction that are well understood to contribute to the worth and durability of brick pavements, nor is the mere use of this filler sufficient to realize the best brick pavement possible, unless the exact and proper refinement of the asphalt is used and it is properly and skillfully applied. Its use must also be accompanied by the skillful installation of the improvement as a whole to produce the best finished pavement. Unfortunately, these requisites are often carelessly dealt with, or ignored altogether, which is bound to result in unsatisfactory pavements. It is essential, of course, that the filler be applied so that the joints shall be completely filled.

Other important details subject to neglect and oversight are:

1. The stabilization of the subgrade by reducing to a minimum the possible moisture content.
2. The smoothness of the artificial base.
3. The uniform compression of the sand bed upon which the brick are laid.

Unless the bed is compressed, the brick wearing surface will ultimately conform to the unevenness of the base surface. This requirement can only be accomplished by using a hand roller and filling the depressions noticed after each rolling. Three or four repetitions are necessary to accomplish the desired results. Compliance with these details will secure an ideal pavement and avoid the impairment of the pavement by contraction and expansion.

ACKNOWLEDGMENT.—From a paper read before the Twenty-Ninth Convention of the American Society for Municipal Improvements, Atlanta, Ga.

Who Shall Pay for Metering Water Services?

By J. O. Craig

Superintendent of Water-Works, Salisbury, N. C.

EVERYONE but the consumer seems to be in agreement that the consumer is the proper person to pay for meters. This question usually comes up when a town is only partly metered and the water department finds it necessary to install meters on a large number of services where the consumers have been using water on a low flat-rate basis. This requires a large number of meters and a correspondingly large amount of money. This money has to come from somewhere, and if the water-rates have been only such as to make a bare living, with just enough for normal extension, one of two things has to be done—the water-rate must be raised, or the cost of the meter and installation must be charged against the party to be served.

In all probability the original tap fee or service charge made for the unmetered service was only large enough to pay for what was furnished, so that the consumer has no right to complain when an extra charge is made putting him on the same basis as new consumers who pay a service fee in keeping with the cost of the meter and its installation.

This, of course, takes for granted that when the old flat-rate consumers are required to pay an additional fee equal to the cost of installing a meter, the water department has a tap fee or a service charge graded according to the size of the service; it also assumes that the original charge made to the flat-rate consumer was not based on this meter cost. If the consumer had paid a service fee large enough to include the cost of the meter and this was charged to those who were furnished with meters, then he should have his meter installed without any extra cost to him.

In Salisbury there is a fixed tapping fee for all services of the same size, regardless of whether a meter is set or not. This fee is nearly large enough to cover the cost of tapping the main and running the service to the property line, including the cost

of setting the meter. The right is reserved to omit the meter or to set it at any time. However, all services are metered at the time they are connected up, except those where no sewerage is available, and should sewerage be installed at these places later, a meter is cut in without further expense to the consumer, since he has already paid for that privilege.

The word "privilege" is correctly used, as this is exactly what it will become if the unreasonable flat-rate consumers force the necessity upon the water department of raising the flat rates to such a point that these consumers will want to know why a meter cannot be set right away. Human nature enters into every problem of a water-works superintendent and especially into anything connected with meters. The first thing any consumer says when his bill suddenly jumps, is, "The meter is wrong." Just as he has to be educated to understand his own responsibility for his sudden rise in water consumption, so also does he have to be educated to be ready to assume his share of the responsibility to the public at large by conforming to rules made to apply to all alike and for the benefit of all.

Meters—the Only Way to Sell Water

There is really nothing fair in trying to apportion water to individual consumers in quantities of any consequence by any other method than measurement by meters. There has to be either a minimum charge or a service charge, and if there is little likelihood of a single-spigot service using more water than would be paid for by the minimum charge, there will be no economy in setting a meter and it would be wasting the public's money to do so; but wherever there is a closet tank, there is likely to be waste of water, and this applies also in lesser degree to a sink. Sprinkling of lawns and gardens is another chance for excessive use of water, but it is very seldom that you

can find much of a lawn or garden on services where there is no sewerage connection, so if we take care of the customers with sewerage connection, we will most likely cover the large users of water.

These consumers have a condition that permits of a possibility of an excessive waste of water at almost any time, and in the absence of a meter the only protection to other consumers is a flat-rate charge large enough to take care of this possibility. This charge would be so large that the consumer would demand a meter, so that we would have to have an agreement on the subject.

The next question is, how is the cost to be assessed? Naturally, the consumer would say the water company should pay the cost, but the water company, unless it is a private company, is nothing but the entire group of individual consumers, and it has to pay the bill just the same. So the question takes another form: Shall the cost be hidden in rates or taxes, or shall it be a specific charge for a definite thing?

If the water department is living within its income and is required to furnish a service line, including a meter, to every customer, it is quite evident that the water-rates would have to be higher than if there was a tapping fee. This is generally recognized as unfair, because prospective consumers would make demands for service out of proportion to the revenue to be expected, since it costs nothing to make the demand and the other citizens have to bear the cost. If the water department has to call on the other departments of the city to make good a deficit brought about by failure to live within their income, the injustice is even greater.

On the other hand, if revenue sufficient to care for the needs of the water department is properly proportioned and the public informed of the reason for this appear-

tionment, there should not be a great deal of trouble in assessing the costs where they really belong.

All water-works revenue comes from two main sources—first and largest, the sale of water, and, second, miscellaneous sources. The miscellaneous revenue includes tap fees, extensions of mains for scattered outlying districts, money from bonds, borrowed money, and, in fact, all revenue except that derived from the sale of water and a fire protection charge. This last charge is collected through taxes in the case of public protection, and from those interested in private fire protection.

The money collected in this manner, with the exception of bonds and borrowed money, is spent almost entirely for extending the system and for the benefit of the individuals who pay it. If the water department is expected to be self-supporting, the division of that department which gives enhancement of value to property by providing water service should also be as nearly self-supporting as possible, so if we all agree

that the property owner should pay a fee for having water connected to his premises, and that the only reasonable way to estimate the water is by a meter, then the only answer is that the cost of the meter should be included in the fee charged.

The meter does not become the property of the consumer, as it is necessary to maintain both the meter and the service, and the water department does not keep in repair something that does not belong to it.

ACKNOWLEDGMENT.—From a paper read before the North Carolina Section of the American Water Works Association.

ETERNAL VIGILANCE

Eternal vigilance is the price of liberty. It is not enough for the citizens to own successful municipal enterprises. They must take an interest in those enterprises, support them, protect them, and cooperate with those to whom they have given the responsibility of running them. —*Winnipeg Hydro News.*

Summary

A property owner wishing a water connection to his premises should pay a tap fee proportionate to the average cost of running a service of that size, including the cost of a meter. This should be a fixed sum for services of the same size.

In the case of metering present flat-rate services, the property owner should pay an additional fee (unless it has already been paid), equal to the average cost of furnishing and installing a meter of the size desired. This is necessary, to avoid charging the consumer a high flat-rate for water service.

In the case of rented property, the owner shall pay for the installation of a meter or pay water-rent for the property.

Garbage Collection and Disposal in Bluefield, W. Va.

A NEW system of free garbage and rubbish collection was inaugurated in Bluefield, W. Va., during the fiscal year ending June 30, 1923. An ordinance covering this was passed and became effective in April, 1923, and has been in operation since that time. The ordinance defines what constitutes "rubbish" and what constitutes "garbage," and requires that all householders shall provide sanitary covered metal containers for their garbage, which must be wrapped in paper before being placed in the container. Rubbish is required to be placed in suitable containers—metal cans, boxes or barrels. The containers are to be placed by the owners on the street curb, or in the alley, whichever is more conveniently reached by the collecting trucks.

All garbage must be disposed of by this method of collection, or by some other method approved by the health department. The Board of Directors, the local name for the

commissioners, made arrangements whereby citizens could purchase approved garbage containers at a special reduced price. These were placed on sale at various stores in different parts of the city for the convenience of the purchasers.

To provide for the collection of the garbage and rubbish, two Ford trucks with special dump bodies were purchased and began operating on April 16, 1923. When the collection commenced, it was limited to the collection of rubbish, because of the large amount which had accumulated. Almost six weeks were devoted to the initial clean-up, during which over 2,000 cubic yards of rubbish were removed. This made a marked improvement in the general appearance as well as the sanitary condition of the city.

In order to facilitate the collection of garbage, the city was divided into six zones. Collections are made twice a week in each zone.



FORD TRUCKS EQUIPPED WITH STEEL BODIES FOR GARBAGE AND WASTE COLLECTION IN BLUEFIELD, W. VA.

Disposal by Incineration

Up to the present time, the refuse incinerator has been able to dispose of all the waste that is collected from the city. It may be that as the amount of garbage continues to increase, the capacity of the incinerator may have to be increased. The amount of material incinerated during the year and the cost of operation of the plant are summarized in the following table:

	Pounds
Amount of night soil incinerated.....	428,015
Amount of garbage incinerated.....	312,930
Amount of other waste incinerated.....	46,705
Total waste incinerated.....	787,650
Total coal used.....	198,600
Amount of waste consumed per pound of coal	4.0
Amount of coal used per pound of waste consumed	0.25
Total cost of coal used.....	\$656.38
Pro rata salary of operator.....	600.00
Total operating expense.....	\$1,316.38
Operating expense per ton of waste consumed	\$3.83

New Street Lights Increase Trade 25 Per Cent

The Story of the Better-Lighting Movement Sponsored by the Western Avenue Business Association, Los Angeles

IN a recent issue of *Light*, Roy Alden tells how the installation of an elaborate ornamental street-lighting system along an outlying business thoroughfare in Los Angeles, backed by the cooperation of the storekeepers in giving full play to lighting effects in their windows, signs, etc., resulted in increasing the volume of sales of stores located on this street by more than 25 per cent in less than one month's time. This affords striking emphasis of the power of light as a promoter of business. The trade of the merchants began to show a material increase in the first two days after the new street-lighting system was installed. A survey at the end of the first month showed a 25 per cent average increase of sales. An increase in property values was also attributed in large measure to the excellent lighting of Western Avenue at night.

The Western Avenue Business Association sponsored the movement to remove the arc lights and to make their business thoroughfare one of the most brilliantly illuminated streets in Los Angeles. Under the city ordinances in Los Angeles, the district may install any street-lighting system it chooses, providing it meets with the approval of the City Electrician and the Art Commission, if 51 per cent of the property owners in any particular community who are directly affected, are agreeable. Estimates obtained by the Association showed

that it would cost the property owners along the seven blocks on Western Avenue, originally selected for the first unit of the ornamental street-lighting system, between \$3.75 and \$4 per front foot for the installation of the system. If this charge were passed on by the property owner to the lessee of a store building, the cost would be about \$1 a month for current for a store with a 20-foot frontage, and in proportion for the larger establishments. The entire project represents an investment of \$35,000 for seven blocks. The city pays an amount equal to what it cost to operate the arc lights, but this amounts only to about 2 per cent of the total bill. Under the provisions of the city ordinance, the entire installation bill had to be paid in advance, as well as the whole of the bill for the year's current.

The Association prepared petitions and circulated them and, while some opposition was encountered, there was no appreciable difficulty in obtaining the required 51 per cent of the signatures in a very short time. The Los Angeles Art Commission was asked to select the most acceptable design for the posts, which were to be of the two-light type of an original ornamental design, equipped with series sockets for 400-candle-power, 6.6-ampere Mazda lights, or 800 candle-power per post. The posts were placed every 120 feet.

WE SUBMIT THAT—

A dollar in a building and loan association is worth fifty in a bucketshop.

—From a bulletin of the National Association of Real Estate Boards.

Construction and Maintenance of Sand-Clay and Top-Soil Roads

By W. R. Neel

State Highway Engineer of Georgia

IT is really surprising how successfully a road properly constructed of carefully selected sand clays or top soils, when intelligently maintained, can care for a large volume of traffic, and what a complete failure a road of this type can be when no care is exercised in the selection of these materials and in their mode of construction.

A concrete pavement is a failure when inferior aggregates are used, when the cement is damaged in handling, when specification requirements as to time of mixing, amount of water, proportioning of materials, etc., are disregarded. Even though all of these errors have been carefully avoided, should the surface be roughly finished or the pavement improperly cured, the construction will be pronounced a failure.

All of us realize fully how important it is to follow carefully the specifications and plans in the construction of a reinforced concrete bridge. We also realize the necessity of following carefully the specifications and plans in the construction of any hard-surfaced road, not only on account of the first cost involved but because we realize that any omission or deviation will probably result in a complete failure and certainly in an inferior job.

One of the objects to be sought after in the selection of top-soil or sand-clay surfacing materials is to secure a proper grading of the small aggregates making up this material, in order to have a dense mass. There must also be a liberal amount of coarse material above a No. 60 sieve.

It is essential that the binder be of good quality and in just the right amount to fill the voids. Too much clay binder will result in a bad, muddy or slippery road in wet weather; too little will result in a very dusty road in dry weather.

Top-soil materials when taken from shaded, uncultivated places generally make a better road surface than similar material taken from a cultivated field. This is due

to the presence of organic matter. Top-soil materials are lacking in uniformity. From one field a variety of materials may be obtained. Because of this fact and the change in the proportion of coarse material and clay as greater depth is reached in excavating for sand-clay, the most important construction feature to be observed after a suitable material has been found is to thoroughly mix these materials when placed upon the road, by the use of a harrow and scarifier or plow, in order to secure a uniformity of composition. It is also essential that a continuous machining of the material be followed during and after construction until the surface has set, to secure a smooth riding surface.

These surfacing materials are to be classed as mixtures of loose aggregates wherein the larger sizes and particles (sand and gravel) have a stability due chiefly to mechanical interlocking or bond, and wherein the finer particles (silt and clay) increase that mechanical stability by filling voids and by greater or less adhesion, usually with the aid of moisture, to the larger particles.

The adhesion of the silt and clay to other aggregates and their own internal cohesion are due in part to the nature of the silt and clay, but are also largely influenced by the amount of moisture present.

The resultant strength of these materials under traffic is dependent upon mass action. The slabs must have adequate thickness and monolithic consolidation. Packed in thin layers—weakness and early raveling may be expected. Mass action in such slabs takes advantage of

- a. Internal arching of the materials
- b. Resistance to direct compression
- c. Resistance to internal shears
- d. Resistance to diagonal tension when the silt and clay are adhesive

Full bearing and impact resistances are not developed near the edges of the uncurbed slabs. Weakness may be expected for a distance about twice the thickness of

the slab from the outside edges if unsupported. Usually these materials are deposited in trenches with supporting shoulders.

CLASSIFICATION OF SOIL MORTARS

	Class A Per Cent	Class B Per Cent	Class C Per Cent
Clay	9 to 18	15 to 25	10 to 25
Silt	0 to 15	10 to 20	10 to 20
Total sand	65 to 80	60 to 70	55 to 80
Sand above No. 60 sieve	45 to 60 Hard	30 to 45 Medium	20 to 30 Soft

The detailed classification, percentage limits, and methods of laboratory analysis and tests are to be found in U. S. Department of Agriculture Bulletin No. 559, issued by the Bureau of Public Roads, and University of Georgia Bulletin Vol. XXII No. 5a. of June, 1922.

Coarse material above No. 10 sieve has a decided influence on the durability, hardness and smoothness of the surface. Ten per cent of such hard, gravelly material with a class B soil mortar justifies reporting the whole as a class A material.

Extensive experience in the field and in the laboratory support the following comments:

(I) As to soils having no coarse material above No. 10 sieve:

a. Classes A and B give respectively admirable and adequate traffic service for the expense involved. It is doubtful whether Class C soil mortars should be used except on secondary roads with very light traffic and when the material is close at hand.

b. The most important factor is the presence of coarse sand in liberal amount. There are, of course, marked differences in the clays and silts, but roads built of many different clays have shown excellent durability. It will be noted that the total clay present in the best samples rarely exceeds 18 per cent. Efforts are being made, however,

to differentiate between clays by laboratory tests, and some tentative progress has been made.

c. It may be accepted that the sand below No. 60 sieve has little supporting value. It has some value in filling voids when coarser sand is present.

d. Highly organic silts have binding value and strengthen the mixture so long as the organic matter persists, but such silts lose the organic matter quite rapidly by decay and dusting.

e. The more adhesive or highly colloidal clays give effective bond with as little as 9 per cent present. Less plastic clays are

needed in larger amount up to a maximum of 25 per cent, but the mixtures with 20 to 25 per cent clay are apt to be slippery and cut into mud in long spells of wet weather.

f. Laboratory tests indicate that the adhesive values of clays are largely dependent upon the colloidal state of the material and the moisture present. Metal plates cemented together with thin films of clay show markedly greater adhesion when containing 5 to 10 per cent of water than when

dried at 212 degrees.

g. In general, it is believed that inorganic silts tend to diminish the strength of road soils, and noticeably so when present above 15 to 20 per cent in the soil mortar.

(II) As to soils containing 10 per cent or more of hard, coarse material above No. 10 sieve:

a. It is a matter of assured experience that such coarse material adds greatly to the durability of the mixtures. Such soils are found in many places and give rise to a series of semi-gravels reaching from 10 per cent up to the 50 or 60 per cent in a full gravel road.

b. A good class A soil mortar with from 20 to 30 per cent coarse

Specifications Must Be Followed Closely to Secure Good Sand-Clay Roads

How many engineers realize the necessity of following closely the specifications in constructing a sand-clay or top-soil surfaced road? How many even feel it of sufficient importance to write a specification on such a road? It is very difficult to impress an engineer with the necessity of skill and care in the construction of this cheap type of road surface. Not until he is charged with the responsibility of maintaining this type of road or has closely observed the greater stability and serviceability of a road of this type when properly constructed, will he realize that if successful results are to be obtained, it is absolutely essential that the same care be given in following the specifications in the construction of this type of road as in the higher and much more expensive pavements.

material gives a fine surface of marked durability. This is especially true of the iron-silica gravels in southwest Georgia with from 25 to 40 per cent of a nodular iron-impregnated gravel, ranging from 1 inch downward. These nodules are not nearly so hard as true silica gravel, but are sufficiently strong to give most excellent service and very smooth travel.

The Effect of Wet Weather

- a. Moderate ground moisture increases the strength of all classes of these roads.
- b. Long and heavy rains influence them as follows:

Class C.—Softens the surface so that wheel ruts 2 or more inches deep may appear under heavy vehicles, and when the sand is fine, considerable material is washed down the steeper grades and into the side ditches. They do not show deep mud and are not slippery. Repairs are readily made with drags and road machines.

Class B.—Softens only after very long and continued wet weather; wheel ruts rarely as deep as 2 inches; not much washing into side ditches. Easily repaired with road machines. Dry out promptly and are usually too hard for any but the heaviest metal drags and light road machines.

Class A.—Do not materially soften except where water stands for a long time in depressions. Wheel ruts rarely deeper than 1 inch. The slab below this surface mud is generally hard and firm and will require the heaviest road machines to reshape the surface. Dries off rapidly and soon becomes too hard for the heaviest road machines to cut.

- c. Laboratory tests show that these road soils are of marked density, are not readily penetrated by rain on the surface, and when made into briquettes with varying amounts of water they retain the larger part of their tenacity until 15 to 25 per cent of water is added.

Thickness and crown:

The thickness used is designed to supply mass action and to provide ample shearing resis-

tance against traffic pressures and impacts.

The usual specification has been 10 inches when packed in place. On weak subgrades, especially those subject to ground water saturation or capillary lift from below, this should be increased to 12 or 14 inches.

Exceeding the above depths, the following is the result:

1. Examination of the packed road slab shows that the hard pack rarely extends more than 6 inches deep. The material below this, while firm, is easily penetrated by a pick and comes up in small pieces rather than as a large clod.
2. The lower portion is thus functioning less actively in bearing resistance, but most probably it serves usefully as a drainage layer and also as a cut-off plane against capillary lift of water from the subgrade. The added thickness also prevents cutting into the subgrade in scarifying and heavy machining when under maintenance. The life of the surface is materially prolonged.

As to the proper crown, the earlier view advocated a high crown, even as much as 1 inch per foot, but later experience has shown that $\frac{1}{4}$ -inch per foot is adequate and much more acceptable to the traffic. This low crown can only be used when under continuous maintenance.

Most Roads Will Have Low Type of Construction for Many Years

I have endeavored to emphasize the fact that although a top-soil or sand-clay surfacing material is recognized as a very low type of construction, it is just as essential that proper materials and care be used in their case as in the construction of the higher types of hard surfaces.

The great majority of our roads will always be without a hard surface, therefore the study of the proper method of construction and selection of local materials is most important. Proper care will make their maintenance possible as well as economical. Carelessness and disregard of scientific principles will result in a complete failure when maintenance is undertaken.

Some engineers who are entirely unfamiliar with this material feel that a road surfaced in this way is little better than an unsurfaced dirt road. This is a mistaken



DRAGGING ONE OF THE GEORGIA STATE HIGHWAYS WITH A ROAD PLANER

idea. In truth, north Georgia travel after rains would be impossible on an unsurfaced road, whereas, by the application of the topsoil material an automobile without chains can safely and comfortably travel over any such surfaced road.

In south Georgia, where the nature of the soil is clay, a like condition exists unless the sand-clay surfacing material is applied.

In the extreme southern portion where deep sand is to be found, it would be almost impossible to travel unless the sand-clay material was first applied to the surface. The great advantage in the use of this material is not only that it makes travel possible in bad weather, but that it costs very little more than common excavation.

(To be concluded in the March issue)

The Cost of Street Cleaning

ACCORDING to the Forty-Seventh Annual Report of the Department of Public Works of Chicago, for the year ending December 31, 1922, 100,291,686 square yards of streets in the First Ward were flushed and cleaned by auto flushers, necessitating the use of 22,005,300 gallons of water at a cost of \$9,259.76, or 9 cents per 1,000 square yards.

Cleaning by horse-drawn flushers in the same ward cost \$6,531.55 for 144,443,139 square yards, using 4,868,000 gallons of water.

In other wards, 261,270,987 square yards of streets were flushed and cleaned by auto

flushers, necessitating the use of 68,653,200 gallons of water at a cost of \$23,513.80, or 9 cents per 1,000 square yards.

In the city, 37,923,732 square yards of streets were swept and cleaned by auto sweepers at a cost of \$7,399.15, or 19 cents per capita.

In the First Ward, 5,315,576 square yards of streets were cleaned of snow, necessitating the removal of 5,104 cubic yards of snow at a cost of \$11,747.43. In other wards, 1,863,112 square yards of streets were cleaned of snow, necessitating the removal of 2,479 cubic yards at a cost of \$5,371.22.

Fifty Miles of Concrete Pavement Completed from Chicago to Hart, Mich.

ON the historic West Michigan Pike, known as State Highway No. 11, the last two gaps in the cement road were closed the latter part of November and at the same hour two stretches of new highway were thrown open in Ottawa and Muskegon counties.

The first stretch of the new cement begins in Ottawa County, three miles south of the Muskegon-Ottawa County line and extends

north for three miles beyond the line dividing the two counties. Plans are under way to continue the concrete road straight to Mackinac. The State Highway Commission plans to build as far north as Traverse City in 1924 and as quickly as possible to carry the work forward until the West Michigan Pike is a concrete road over its entire length from Chicago to the Straits.

Progress in Sewage Sludge Disposal in the United States

Abstract of Report of Joint Sludge Committee of the American Society for Municipal Improvements and the American Public Health Association

THE recent report of the Joint Committee on Sludge for the American Society for Municipal Improvements and the American Public Health Association is a progress report outlining what has been done in solving the sewage sludge problem in the United States. The report is divided into several parts, each of which deals with the specific work of the various organizations handling the investigation.

Investigations of Milwaukee Sewerage Commission

T. Chalkley Hatton reported that the Milwaukee Sewerage Commission appointed a Fellow to the Agricultural College of the University of Wisconsin and that he has devoted his entire time to the use of sludge in agriculture. Intensive studies have been made of the values of activated sludge in comparison with commercial fertilizers and different mixtures. Plantings were made of corn, soy beans, Sudan grass, tobacco and other crops at the experimental farms of the University of Wisconsin at Marshfield, Hancock, Codington, Madison and Wauwatosa. To determine the value for grass in golf greens, tests are being made at the Blue Mound, Ozaukee, Lynx and Tripoli Golf Clubs, the Milwaukee Country Club and the Pine Bluff Country Club. A large number of pot cultures have also been made at the greenhouses of the University of Wisconsin. The National Fertilizer Association, of which the Milwaukee Sewerage Commission is a member, has also been advised of the possible value of activated sludge. Samples have been sent to various fertilizer distributors for investigation. The cooperation of the Executive Committee of the Association has been assured in handling and marketing the prepared sludge should it prove as satisfactory as appearances indicate.

Sanitary District of Chicago

The Sanitary District of Chicago has interested a number of agricultural experi-

ment stations in growing tests. Work is under way on cotton in Mississippi and on garden plants at the University of Illinois. In the Chicago territory sludge has been distributed to peony and rose growers, truck farmers, cabbage growers and to various individuals. The Lincoln Park, West Side and South Park organizations are trying sludge on lawns and grass plots.

The district has operated a test plot during the growing season, planting corn, beets and beans, with various combinations of fertilizer. Some 45 plots, each 1,100 square feet in area, were planted. The land, while formerly used for truck gardening, has lain idle for over four years. The results in general have been encouraging. A record of weights is being kept as the vegetables are picked, which will furnish a criterion of the real relative production. In addition, the District has used sludge in seeding grass, in comparison with sheep manure. The best price obtained during the year on the sale of car-load lots was \$9 per ton f. o. b. cars for sludge dried and bagged.

Baltimore

Milton J. Ruark, Division Engineer of Sewers, reports that during 1922 the total production of sludge at the Baltimore plant was 5,400 tons on a dry basis. This is the greatest rate of production in any year since 1918, when the output was somewhat greater. A portion of this was heat-dried sludge from the drying plant, and the remainder air-dried sludge taken by local farmers. For more than a year no charge has been made for air-dried sludge. This season farmers have taken the sludge as often as it is produced by the sand beds, so that the drying plant has not been operated for several months.

At the present time no income is being realized from the sale of sludge. The city has provided means for loading the farmers' trucks from a trestle by dump-cars direct from the sand beds or by derricks from the

storage pile. As the rule, the farmer arranges to handle sludge only when the city is operating one of the loading devices. Occasionally a farmer loads his own truck. The sludge is all used within a radius of about 4 miles, whenever possible, the farmers hauling it directly to the field, where it is spread and plowed under. Sometimes it is placed in piles or composted with manure for spreading on the fields at a later date. The farming community served is almost entirely composed of truck farmers. The sludge is therefore used to a large extent for such plants as cabbage, spinach, potatoes, string beans and tomatoes. It is used to some extent on corn and to a very limited extent on grass. The amount of horse and cow manure available has decreased markedly in the last few years, with the result that its cost has reached a point where farmers are seeking other materials for fertilizer.

While it is evident that the farmers in the vicinity of the Baltimore plant believe that sludge is worth the handling, the city officials have desired to satisfy themselves of the real value of the sludge in agriculture. In cooperation with the Agriculture Experiment Station of Baltimore, a series of experiments have been outlined to extend over some four or five years. Nine acres have been laid out in six sections of $1\frac{1}{2}$ acres each, each section being divided into plots of $\frac{1}{4}$ -acre each. The whole of each section has been treated with one of the following fertilizers: liquid digested sludge, air-dried sand-bed sludge, commercial fertilizer, commercial fertilizer and dried sludge, and manure. As a rule, one plot has been given no treatment. One-half of each section is treated with lime in a manner to cover half of each plot. In one plot of each section will then be planted some crop, and likewise with each of the other plots, so that in any year some crop will be growing on ground treated with all of the six fertilizers, both with and without lime. Rotation of crops will probably be introduced, but the ground will receive the same fertilizer year after year. A special experiment with alum-treated sludge will also be started on other ground.

On September 15, 1923, the farm was already growing late potatoes, beans and fall cabbage. Spinach and grass seed have been planted, and it is proposed to add an-

other crop next spring, probably tomatoes, making a total of six different crops.

The preparation of air-dried sludge for the year 1922 cost 66.6 cents per ton.

Rochester, N. Y.

John F. Skinner, Deputy City Engineer, reports that at the Irondequoit plant, Rochester, N. Y., about 10,600 cubic yards of Imhoff sludge were prepared for marketing in 1922 by air drying. This sludge was sold to farmers at an average price of 75 cents per load of 2 cubic yards, delivery being made by a tippie to the teams and auto trucks. When shoveled from storage, only 50 cents per load was received by the city. The sludge is largely used in the top dressing of the orchards for a distance of 7 miles around the plant.

Houston, Texas

J. C. McVea, City Engineer of Houston, reports that during the calendar year 1922, 4 cars of sludge were sold. The buyers preferred sludge that had not been pulverized. Five tons were delivered to local truck growers and others for use near Houston. The results obtained by various gardeners and by the Houston City Park Superintendent on the municipal golf course and in the parks have been very gratifying. Growing experiments were made on a small scale with turnips, tomatoes, lettuce and radishes, in which the value of sludge as a fertilizer was demonstrated. The turnips in particular were vastly improved; the ones fertilized with sludge were the only ones edible, being sound and sweet, while the others were dry and fibrous.

PERCENTAGE INCREASE OVER UNFERTILIZED TURNIPS

No.	Weight in —Ounces—			Per Cent —Increase—			How Fertilized
	Total	Roots	Tops	Total	Roots	Tops	
1	11	3	8	0	0	0	Not fertilized
2	18	7	11	64	133	38	Blood
3	41	14	27	273	367	237	Nitrate soda
4	63	28	35	473	832	538	Activated sludge
5	59	31	28	436	932	250	Activated sludge and phosphoric acid

Preparation of Sludge

In the preparation of the sludge, development of methods and apparatus is still progressing with very encouraging results.

At Milwaukee the tests on sludge handling have been ended, with the conclusion that provision should be made for the use of acid and heat with the Oliver filter.

At the Des Plaines River sewage treatment plant of the Sanitary District of Chicago, dewatering has proceeded, using alum or acid with and without heat. At first only a Worthington bag platen press and a Simplex plate press were available. In August tests were begun on a novel hydraulically operated bag press, designed by Berrigan, with direct squeeze, which has the advantage of taking care of any desired thickness from $\frac{1}{4}$ -inch upward. The press cake, which contains from 73 to 83 per cent moisture, is dried in a rotary direct-indirect dryer. A pulverizer is required to crush the balls which occur, though not in large number.

At the Calumet sewage treatment works of the Sanitary District dewatering has proceeded, using alum or acid on the Oliver filter installed. This filter is the largest size built, the drum being 11 feet 6 inches in diameter with a face 14 feet wide. Space has been left in the house for a Basco-ter-Meer centrifugal. A dryer similar to the one at the Des Plaines River sewage treatment works operated on the sludge cake intermittently.

At the testing station operated jointly by the Sanitary District of Chicago and the Corn Products Refining Company at Argo, tests have been run on plate filters and a single-wheel American rotary filter. Alum has proved more successful as a coagulant than acid.

At Houston the cost of preparing the sludge has not yet developed to a point where definite costs can be given. Several methods have been tried. At the present the use of sulphur dioxide gas is being tried to prepare the sludge for pressing. There has been no complaint of odor from sludge handling or the preparation of the sludge.

The nitrogen recovery in activated sludge at the various points of operation is shown in the following table:

Location	ACTIVATED SLUDGE	
	Recovery of Nitrogen and Phosphoric Acid Nitrogen as N; Phosphoric Acid as P_2O_5 Per Cent Dry Basis	
	N	P_2O_5
Sanitary District of Chicago		
Argo	7 to 8	6 to 7
Tannery	3.0	
Packtown	4.2	2.7
Des Plaines R.S.T.W.	4.5 to 5.5	2 to 4
Calumet S.T.W.	4.2 to 4.4	
Houston	4.6	1.9
Milwaukee	6.0	2.3

Local Improvement Work in Spokane

SIXTY-ONE local improvement jobs have been started and practically completed in Spokane since the opening of the spring construction season of 1923, at a cost totaling \$294,491.58, according to a recent statement by A. D. Butler, City Engineer. Included in the report are grading, curbing, sidewalk and paving operations. The big jobs of the year were the paving projects, amounting to \$71,885;

eleven grading jobs at a total cost of \$15,927; and 33 curb and sidewalk jobs for \$85,956.

Mr. Butler states that there is a definite tendency to improve the property near the center of the city and avoid extending the improvements. This tendency is to build up districts already in existence and to permit the growth of the city to be cared for by bettering districts already laid out.

Boston Better Prepared to Fight Snow This Year

IN 1922 the city of Boston had only three snow-plows, a few horse-drawn scrapers and one tractor as its snow-removal equipment, according to a letter of Hon. James M. Curley, Mayor, addressed to the Finance Commission of the city of Boston. In July of 1923 50 snow-plows were purchased and are available for use. Also during the year 1923 the Public Works Department purchased nine motor vehicles for use in snow removal, two snow loaders and one tractor, and has developed an organization competent to handle the snow-removal equipment purchased by the city.

In his letter Mayor Curley says: "It is impossible to estimate the financial loss sustained by the business houses of Boston due to the lack of equipment and the delay in removal of ice and snow during last winter. It was estimated in the city of New York that the losses

to business houses during the winter of 1920 were in the vicinity of \$60,000,000, and as a consequence in order that similar conditions might not again obtain, the city of New York expended for snow equipment some \$2,000,000. The wisdom of the step taken by New York has been emphasized during the last two years."

The city of Boston is divided into districts, in each of which a snow-removal contract is awarded. It has been found in the past that where the rule of awarding only to the lowest bidder has been followed, some difficulty has been experienced by some of the contractors in securing adequate help, and because of this the Commissioner of Public Works now awards the contract only to reputable and responsible bidders who are known to be able to handle the contract and remove the accumulation of snow and ice upon the streets of the city in the shortest possible time.

Lowering a Street Grade in Utica

By C. M. Niles

THE city of Utica, N. Y., is lowering the grade of Genesee Street, the principal business thoroughfare, for a distance of 700 feet in the very heart of the city. The maximum change of grade is about 5 feet. The objects of the improvement are both practical and esthetic. The entire street will be given a uniform gradient by eliminating a slight elevation, known

a quarter of a mile on each side of the regrade.

The change of grade necessitated the relocation of trolley tracks, sewers, water-mains, telephone and electric conduits, all of which was accomplished without interruption to service. In changing the sidewalk elevation, long stretches of walk were successfully lowered, without injury to the



LOWERING THE GRADE OF GENESEE STREET, UTICA, N. Y.

The curbing at the right-hand side of the street shows the difference between the new and the old elevation. The new proposed street will cross Genesee Street where the tool house stands

locally as "the hump." The lower grade will permit the construction of a new intersecting cross-town street, which will relieve traffic congestion in the busiest part of the city. This new street, which will be exceptionally wide, will also aid in solving the down-town parking problem. On Genesee Street, the curbs will be set back and the roadway widened and newly paved for

heavy concrete slabs and sidewalk lights. The walk was shored up and the excess material removed from underneath. Then jacks were used to lower the huge expanse of concrete, steel and glass to its new position. The cost of the entire improvement, including construction work and damage to adjacent property, will probably exceed half a million dollars.

EVERY BUILDING IS TO SOME EXTENT A PUBLIC MATTER

As all buildings are seen, society has a right to demand that none be ugly; the life of the community requires that none be unsafe or dangerous to health; social economy requires that they be not wasteful of space or ill-suited to the purpose for which they are created. Every building is to some extent a public matter—even a private house. No building should be erected that is not an attractive addition to the landscape. A well-designed building is a more valuable property—a better investment. A well-constructed building is a more economical investment.

—From a recent statement on "The Functions of the Architect," issued by the American Institute of Architects through its Committee on Public Information.

Outstanding Problems in Highway Bridge Design

By E. F. Kelley

Senior Highway Bridge Engineer, U. S. Bureau of Public Roads

ONE of the first problems with which the bridge designer is confronted involves the selection of suitable live loads for design. This problem is an important one at the present time, for in this respect highway bridge specifications have not kept pace with the great changes in traffic conditions that have taken place in recent years. An interesting illustration of this fact was brought out in a recent study of state specifications, which showed that 16 states were still using uniform live loads practically identical with those specified for Class B-1 bridges in Theodore Cooper's specifications of 1896. This shows the effect on modern specifications of a specification which was introduced at a time when there was no conception of the extent to which highway traffic would develop, both in density and in weight.

Concentrated live loads which may be considered as producing the most severe stresses in ordinary highway bridges are motor trucks; trucks with trailers; road rollers; steam, gas and oil tractors; steam shovels, cranes and dragline excavators; and military loads. Of these, the various excavating machines and the heavier units of military equipment may properly be considered as exceptional loads, although provision must be made for them. In respect to weight and weight distribution, the heavier road rollers and tractors are very similar to heavy trucks, and any specification which provides for the typical heavy-duty trucks will provide amply for rollers and tractors. For this reason, and since motor trucks make up the great bulk of heavy highway traffic, the quite common practise of adopting them as representative of all heavy equipment is justified.

During the summer of 1921, information relative to a considerable number of truck models was collected, and this material was presented as a portion of the 1921 report of the Subcommittee on Bridges and Struc-

tures of the American Association of State Highway Officials. These data show that, under rated capacity loads, 5-ton trucks average about 10½ tons in total weight, and 7½-ton trucks average about 13½ tons. But these are by no means maximum weights, as the overloading of motor trucks is almost universal and overloads ranging from 50 to 100 per cent are not uncommon. Under a 50 per cent overload, 5-ton trucks average about 13 tons in total weight, and 7½-ton trucks about 17½ tons. Under heavier overloads these weights may approximate 15 and 20 tons, respectively.

What may happen in the way of overloading was well illustrated in some recent bridge tests. It was necessary to use heavy truck loads, but no heavy-duty trucks were available. A 3½-ton truck was loaded with gravel until the total weight was in excess of 14 tons, and it was successfully operated for a considerable period of time. This is an exceptional case but goes to show that a 3½-ton truck does not necessarily mean a 3½-ton pay load.

In motor trucks operating under capacity loads an average of about 77 per cent of the total load is concentrated under the rear wheels, and with a 50 per cent overload the average load under the rear wheels is about 80 per cent of the total. The average length of wheel-base is about 14 feet. These figures, which are of importance from the standpoint of design, may well be contrasted with the 10-foot wheel-base and two-thirds of total load on rear axle which are quite commonly assumed in bridge specifications.

Of equal or even greater importance than the determination of present-day requirements is the consideration of what the future may bring forth in the way of increased highway loads. Legislation may temporarily restrict the weights of vehicles, but it will not do so indefinitely if new developments in truck and pavement design make possible

the economic use of heavier units. It has already been quite definitely established that the damage to road surfaces depends on the wheel concentrations rather than on the gross weight of vehicle, and in this connection it is well to note the development of six- and eight-wheel trucks which may make possible greatly increased gross weights without increased wear on pavements. We are to-day discarding thousands of old bridges which are still serviceable for the traffic for which they were designed but which are inadequate for modern traffic. In order that the so-called permanent bridges

on a bridge should be the same as on the adjacent highway, so that there will be no restriction of traffic due to the presence of the bridge structure. In the majority of cases it is not practicable to attain this ideal condition on account of cost considerations, and we have come to regard it as a foregone conclusion that the more expensive structures will necessarily impose some restrictions on traffic. Narrow roadways are a menace, and necessary restrictions should be reduced to the minimum practically attainable.

The roadway width should be based on



THIS COLLAPSE WAS CAUSED BY TOO NARROW A ROADWAY AND AN UNPROTECTED WEB SYSTEM

The bridge was totally wrecked when a truck and a passenger car tried to pass on a narrow roadway. The truck knocked out the unprotected web system of the truss

which we are now building will not have to be discarded for lack of carrying capacity before they are worn out, we must consider, in designing them, the possibility of future loadings far greater than may now be considered probable.

That there is need for a modern loading specification and a more uniform practise with regard to live load requirements, is made evident by a study of existing specifications. Considering the country as a whole, there is undoubtedly need for several classes of loading, but the loads to be used should be based on present and probable future traffic conditions and not on state lines.

Width of Roadway

The bridge is an integral part of the highway and should be so considered. Theoretically, therefore, the roadway width

the number of lanes of traffic for which provision is to be made and should be a multiple of the width required for one lane. To provide a width of roadway which is not an exact multiple of the width of a traffic lane is not economical, since the portion of the width in excess of that necessary for a certain number of whole lanes adds to the cost of the structure without increasing its traffic capacity.

There is some difference of opinion as to the proper width which should be assumed for a traffic lane, and there has been considerable discussion as to whether it should be taken as 9 feet or 10 feet. In my opinion, the correct figure to be used depends on the purpose for which the assumption is made. A width of 9 feet is undoubtedly sufficient for the passage of one line of vehicles, and, therefore, for the determination of design



WELL-DESIGNED CONCRETE BRIDGE WITH APPROACH FILL

The full width of the approach fill is insured by the suitable wing-wall design. The flaring rails protect traffic and improve the appearance of the structure

loads, the width of 9 feet should be assumed. Otherwise we shall have 18-foot roadway bridges designed for one line of traffic when actually they will carry two. But a width of 9 feet is somewhat narrower than is desirable from the standpoint of safety and usually will tend to slow up traffic. Therefore, it is most desirable that the actual width of roadway as constructed should be based on the 10-foot traffic lane, thus providing greater safety for fast traffic and reducing the tendency toward traffic congestion.

It may be said that roadway widths for bridges on main highways should be at least sufficient to provide for two lines of traffic. This means that the clear width of roadway must be at least 18 feet and, for the reasons already stated, preferably should be not less than 20 feet. Furthermore, it may be said that, on paved roads, the distance between bridge curbs should be at least as great as the width of the pavement and preferably should be somewhat greater. Otherwise traffic may be somewhat restricted, since a vehicle will not usually travel as close to a curb as it will to the edge of a pavement.

Bridge Approaches

Intimately connected with the width of the roadway on the bridge itself is the proper treatment of the approaches. Too often the presence of a bridge structure is indicated to the approaching driver only by unsightly, square-ended bridge rails looming up ahead and located well in toward the center of the highway, the approach fill being narrowed to meet the narrow roadway on the bridge. This indication of a restricted roadway without adequate approach protection is, unhappily, not always apparent at night. Such structures are not only an eyesore architecturally but also an actual menace to traffic. The shoulders

of the narrow approach are difficult to maintain at the end of the bridge, and if not maintained add still more to the danger to traffic. They may be widened by means of riprap and should be protected by guard-rails converging toward the ends of the bridge. On new structures this condition may be avoided by proper design.

For obvious reasons, the bridge approach should be on a tangent or a very easy curve, and sharp curves should be avoided. An adequate width of approach may be provided by building the abutment wing-walls with horizontal tops for a portion of their length, the horizontal portion being of such length that the approach fill may be maintained at full width to the end of the bridge. The wide approach fill provides for easier maintenance of shoulders and increases the safety of vehicles. In connection with the wide approaches, flaring rails at the ends of the structure give it an improved and finished appearance, increase its visibility to approaching drivers and serve to prevent vehicles from going over the wings. These flaring rails should extend to the shoulder of the fill or be supplemented by substantial guard-rails.

(To be concluded in the March issue)

Forward Steps in City and County

A Simple System of Bench-Marks for Determining Survey Levels

RICHMOND, VA.—A new system of bench-marks has been established in Richmond by the Bureau of Surveys of the Department of Public Works and has proved so successful that the Bureau feels it can heartily recommend the idea to any city having difficulty with its level work. The bench-marks previously used in Richmond were ordinarily placed on corner stones, and because of the chance of their being disturbed there was always more or less doubt as to the accuracy of the information. To obviate this difficulty, the standard type of bench-mark shown in the accompanying illustration has been adopted. By the most careful level work, carried on under the direct supervision of Gamble M. Bowers, Chief of the Bureau of Surveys, 323 of these marks have been distributed throughout the city and to a limited extent in the territory beyond the corporate limits. The frequency is about seven per square mile within the city and about three per square mile in the surrounding areas. The bench-marks have, as a rule, been set in the sidewalks and are so substantial that there is little or no danger of their being disturbed.

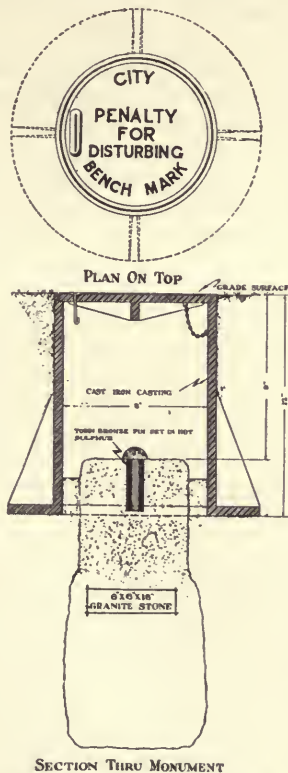
To make this new system as useful as possible, there has been issued in loose-leaf form a general map of Richmond on which the city is marked off into sections, followed by a skeleton map of each section showing the location and number of the bench-marks. In addition to the maps are sheets on which the bench-marks are listed by numbers, with a record of their elevations and descriptions of the locations. These sheets are of the

same size and type as those in the loose-leaf note-books in general use by the Department of Public Works and most engineers in the city, and may therefore be conveniently fitted into the note-books already in use.

This simple system has given the greatest satisfaction, and has been of benefit not only to the engineers of the Department of

Public Works, but to other local engineers who have had occasion to do level work.

ALLEN J. SAVILLE, Director,
Department of Public Works.



SECTION THRU MONUMENT
STANDARD BENCH-MARK,
RICHMOND, VA.

Small City Insures Members of Volunteer Fire Department

PITTSBURG, CALIF.—Accident insurance policies on all volunteer members of the local Fire Department have recently been taken out by the city of Pittsburg. Each policy has a value of \$2,000 in the event of accidental death, with an allowance of \$125 per month for three months in case of injury, and \$80 per month for life if the injury sustained causes permanent disability. These volunteers are, of course, insured under the State Compensation Fund, but the city has realized that the benefits received from this source in case of accident are not sufficient to do more than provide for medical care, drugs, etc.

In taking this step, the city officials feel that two results are being accomplished: first, the volunteer fireman receives a small additional acknowledgment of his services, in that the policy covers the insured while following his usual vocation as well as during the time spent with the Fire Department; and, second, the city is relieved of the moral obligation to compensate one volunteering his services in fighting fires in the

event of injury, or to provide for his family in case of death. The annual premium of each policy is \$20, and the benefits derived make this expenditure on the part of the city well worth while.

R. M. DORTON,
City Manager.

Procedure in Checking Subdivision Maps

LOS ANGELES, CALIF.—The accompanying cut shows, in diagrammatic form, the necessary procedure in checking subdivision maps as used in the office of the City Engineer of Los Angeles. This diagram was prepared under the supervision of the writer after nearly twenty years of experience in handling subdivision maps for the city, and it is believed that a similar form can be used to advantage by other communities. A careful study of this diagram will show the immense amount of detail which must be attended to in order that subdivision maps shall conform to the subdivision law and be entitled to record.

It is of the utmost importance that the maps receive the most careful checking as to their mathematical accuracy and be properly monumented and tied to subdivisions which have been previously recorded, and if possible referred to corners as established by the United States Government, thereby protecting the seller, as well as

those who purchase the property, from possible litigation in the future.

Particular attention must be given to seeing that all necessary signatures of the owners of the land appear on the maps and are properly acknowledged in legal form, and where streets are offered for dedication, it is the practise of the city of Los Angeles to require a certificate of title showing all the parties necessary to make complete dedication of the land offered for public use. This is very important in order that public improvements may thereafter be made under the various state laws.

JOHN A. GRIFFIN,
City Engineer.

Fire Prevention Exhibit and High School Essay Contest

HERKIMER, N. Y.—In an effort to reduce the fire loss in this city during the coming year, the Municipal Commission of Herkimer conducted a fire prevention campaign in December. As part of the educational campaign, the exhibit here shown was displayed in a store window for a period of about two weeks. In the center was shown a fire-alarm box of the type at present in use in Herkimer, with the doors removed in order to show clearly the working parts of the box. On either side of the alarm box were exhibited various types of Foamite-Childs fire extinguishing apparatus: the

[illegible]

soda-acid extinguisher for all ordinary fires; the "All Weather" extinguisher, which is non-freezing and should therefore be available for use during the winter months; the "Fire Gun" extinguisher for electrical and automobile fires; and the extinguisher for high inflammables, such as oil and gasoline.

The Commission also conducted an essay contest in which eleven prizes were offered for the best essays by pupils of the Herkimer High School on the subject of fire prevention. A first prize of \$5 and ten prizes of motion picture theater tickets were awarded. The Fire Department headquarters cooperated with the students taking part in the contest by giving information regarding the various types and uses of fire extinguishers, fire-alarm boxes, etc.

ARTHUR T. CLARK, Superintendent,
Municipal Commission.

Ten-Year Improvement Program Suggested for Kansas City

KANSAS CITY, MO.—Mayor Frank H. Cromwell has made suggestions for bond issues totaling over \$20,000,000. Subject to such changes as public discussion and investigation show to be desirable, the list is as follows:

City Hospitals	\$600,000
Nurses' Home	300,000
New Negro Tuberculosis Hospital	100,000
Municipal Farm	100,000
Police Improvements	500,000
Fire Department	1,565,000
Swope Park	1,000,000
New City Hall	3,000,000
Public Stadium	1,000,000
General Park Improvements	750,000
City Deficit	3,000,000
General Sewers	5,000,000
Sewer Division	500,000
Bridges and Viaducts	1,000,000
Elimination of Traffic Hazards	1,000,000
City's Share of Improvements	1,000,000

Total tentatively proposed.....\$20,415,000

There is considerable discussion of the proposals in Kansas City and considerable opposition. One general reason for opposition which has more than local interest is that while many of the items suggested are very large, on most of them there are no detailed plans or cost estimates. Neither is there much information as to immediate needs. There seems to be little reference to any general plan or program.

The Public Service Institute has suggested that before any vote is had, a study

of the probable improvement needs, as well as operation costs of the city for a period of ten years, be made, with plans to finance all these needs over the ten-year period. Improvements could then be made in an orderly manner with reference to importance, immediate need, and to other parts of the program.

Other considerations which will affect the determination as to what amounts, if any, are to be submitted, are: the opposition to any bonds now because of dissatisfaction in certain quarters with the city government; opposition to any increase in governmental costs; and a "charter before bonds" slogan. On the other hand, a few of the proposals are getting much support.

WALTER MATSCHECK, Director,
Kansas City Public Service Institute.

Increased Salaries for Police and Firemen

MONTCLAIR, N. J.—Beginning with the first of January, 1924, a flat increase of \$500 per annum was applied to the salaries of all members of the Police and Fire Departments of Montclair, N. J., as the result of a popular referendum carried at the last November election. The new scale of salaries is as follows:

POLICE DEPARTMENT

Chief of Police.....	\$3,800
Captain	3,000
Lieutenants	2,800
Sergeants	2,700
First-grade patrolmen	2,500
Second-grade patrolmen	2,400
Third-grade patrolmen	2,300
Fourth-grade patrolmen	2,200

FIRE DEPARTMENT

Fire Chief	\$3,800
Assistant Chief	3,300
Captains	2,800
Lieutenants	2,700
Foreman of the fire alarm telegraph....	2,700
First-grade firemen	2,500
Second-grade firemen	2,400
Third-grade firemen	2,300
Fourth-grade firemen	2,200

The terms first, second, third and fourth grade, as used by the Police and Fire Departments, apply to permanent members who have served three years and over, two years, one year, and less than one year, respectively.

HARRY TRIPPETT,
Town Clerk,

The Progress of City Planning Law During 1923

By Frank B. Williams*

IN the field of city planning law, 1923 has been a year of activity. In zoning, that activity has manifested itself both in the courts and in the state legislatures; elsewhere it has been, almost exclusively, legislative; and it is the character of the legislation, throughout the field of city planning law, that has made 1923 a year of substantial progress in planning.

Zoning

The zoning events of the year have been reviewed, month by month, in these columns, and for that reason will not be considered here at length. There have been many judicial decisions during the year which have generally been regarded as unfavorable to zoning; but it may be doubted whether they are actually so to anything like the extent supposed. Almost without exception, these decisions, when analyzed, will be found to hold certain clauses of specific ordinances to be unreasonable, or to have been passed without proper state enabling acts; and in this the student of zoning law is often forced to agree with the courts. There are also, in some of the opinions, statements criticising or condemning zoning in principle. These statements are almost invariably dicta not necessary to the decision of the point at issue, to which judges in later controversies, especially in other states, will not feel themselves bound to give great weight. And it is especially noteworthy that well-drawn ordinances exercising the drastic police power of the state reasonably and with moderation, when founded upon sufficient state enabling acts, have invariably been upheld. In this connection it is encouraging to note that most of the zoning acts passed during the year have been modeled on the standard enabling act prepared by the Department of Commerce at Washington.

Regional Planning

The most important legislation of the year, potentially at least, is that with regard to re-

gional planning. In this field Massachusetts is a pioneer. More than fifty years ago she passed a law creating a sewer system for an area around Boston of about 400 square miles, including 39 cities and towns; followed by similar statutes with regard to water-supply and parks. The control of these activities is now centralized in a Metropolitan District Commission. In 1923 (ch. 399) a division of metropolitan planning was created in the Commission, to investigate transit, advise the various governmental units in the district, and consult with them with regard to it.¹

In Ohio the legislation (Code sec. 4366-13 to 19) is more novel. It authorizes counties and groups of municipalities to create regional planning commissions, with power to make plans of the region which, if adopted by a city planning commission, shall be binding to the same extent as a plan of the city commission, that is, may be overruled only by a two-thirds vote of the council and the head of the department concerned; and if adopted by a county, may be reversed only by the unanimous vote of the county commissioners.

County Planning

Identical, in many but not all of its aspects, with regional planning is county planning. The most novel provision in this field is in the so-called Nassau County charter, in New York,² passed by the Legislature and awaiting ratification by the voters of the county in 1925. It creates a county planning commission to which must be referred before final action thereon the planning and zoning ordinances of the cities and villages of the county, as well as similar action of the county commissioners for the unincorporated areas.

The novelty in the planning field is the section with reference to the zoning of the strip, 500 feet wide, on each side of the boundary of contiguous communities. There is a tendency in zoning to push objectionable activities out into the outskirts of a community, to the disadvantage, often, of the neighboring community. This evil is especially evident in local governments which, by reason of their small area, are unable, in their zoning, to protect themselves from their neighbors. The Nassau County charter provides that in so far as a zoning

*EDITORIAL NOTE.—The writer of this article is the author of the book entitled "The Law of City Planning and Zoning" (The Macmillan Company, November, 1922), and of "Zoning Notes," appearing monthly in these columns. This article is a review of city planning events in the legal field during the year just past, excepting zoning, covered by the "Notes." The readers of THE AMERICAN CITY who own Mr. Williams' book therefore have at their command complete information in this department of city planning to January 1, 1924.

¹An excellent short article on this subject, by Arthur A. Shurtleff, entitled "A Pioneer in Regional Planning," appeared in *Housing Betterment* for November, 1923. The official reports of the Commission and its predecessors are too well known to need citation.

²Acts of 1923, Ch. 863.

ordinance of a village or city affects the 500-foot strip of its territory contiguous to another village or city, it shall not go into effect until ratified by the council of that village or city; or, in default of such ratification, by a three-fourths vote of the county commissioners; in so far as the unincorporated areas of the county are concerned, the provisions being similar. These ordinances under the charter, like all planning and zoning regulations, must first go to the county planning commission before final action on them. It is hoped that these provisions will promote mutual consideration and adjustment among the communities of the county to the common good.

In a number of other states, the formation of county planning commissions has been provided for.⁸

Establishment of Street Plans

Perhaps the most important problem awaiting practical solution by the city planner in this country is the establishment of the city plan, in advance of the taking of the land for streets, on such a basis that it cannot be infringed on by the owner of the land planned. In the absence of legislation accomplishing this result, the landowner, in a multitude of cases, has built in the bed of mapped streets, and rendered future thoroughfares, essential to the proper growth of the community, so expensive that they could not be constructed.⁴

A method proposed⁵ for the establishment of street plans has made some progress during the year. By this method the application of the landowner for a permit to build on land belonging to him that is found to be in the bed of a mapped street is refused, but he is given an appeal to a board of appeals. The board, if it finds that injustice has been done the landowner by reason of the fact that his unimproved land in the future street does not bring him in a fair return, is authorized to issue the permit for a building of a character which, while yielding a proper return, will interfere as little as possible with the construction of the future street. This can be done, as a rule, by allowing a temporary building to be erected which will amortize itself before the street will be needed; but, as a rule, if the street is provided as soon as it is needed, no injustice will be done the landowner by refusing the permit altogether. The virtue of the suggested statute is that it eliminates the exceptional case of injustice, which would otherwise make the law unconstitutional. A provision of this sort is contained in the Nassau County charter, already referred to; and in city planning legislation, passed by the Legislature, for St. Petersburg,

Fla. The provisions in both cases are parts of measures subject to ratification by the voters.⁶

Planning Commissions

Statutes have been passed during the year providing in a number of states for the creation of planning commissions. A table of these statutes is given below.⁷

Interstate Compacts

City planning students will remember the administrative and jurisdictional problem of metropolitan New York in planning, as a whole, the harbor of New York, situated in two states and divided into four hundred separate local governmental units; which was solved by the amendment of an existing compact between the two states, ratified by the United States Government.⁸ A similar problem has confronted a number of western states in the regulation of interstate rivers, and has been met in a way identical in principle to that adopted by New York and New Jersey, although in detail the compacts are much less interesting to city planners.⁹

Eminent Domain and Excess Condemnation

The intensity and rapidity of modern traffic has brought into prominence the importance of an unimpeded view at street intersections. In one or two zoning ordinances provisions to secure such a view through structures at street corners have been introduced. A question has been raised whether such a provision, under the

⁴ Practically identical provisions were embodied in a bill prepared by the city of New York and presented by it to the State Legislature; and in a proposed revision of the charter of the city. Neither of these measures became law.

The student of this subject will remember that in Pennsylvania, alone among our states, laws practically forbidding landowners, in any case, to build in the bed of mapped streets have been sustained by the courts. (See "The Law of City Planning and Zoning," p. 30.) A measure (1923, p. 135) passed in deference to recent decisions in that state, has much limited the application of these laws to parkways.

A law of a different nature, authorizing cities in Michigan to adopt plans for streets for their territory and for areas outside of and within three miles of their limits (1923, no. 119), may be noted.

⁷ Ohio, Code 4366-1 and ff.; the powers of planning commissions have also been increased with regard to platting, which see.

Oklahoma, 1923 ch. 177.

Michigan, 1923 no. 119 (extension of home-rule powers to create departments).

Maine, Private Laws 1923, ch. 109 art. VI, sec. 13; ch. 104 sec. 26; being two charters for the city of Portland, passed subject to referendum. In each case they give planning powers to a park commission. Pennsylvania, 1923 p. 855 (boroughs).

See also county planning, above.

⁸ See "The Law of City Planning and Zoning," pp. 10, 549, 597.

⁹ The rivers regulated were the Colorado, by Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming; the South Platte, by Nebraska; the Missouri, by North Dakota, South Dakota, Montana; the La Plata, by New Mexico, Colorado; the Rio Grande, by New Mexico, Colorado; in each case the ratification of the Congress of the United States being necessary, and in some cases secured.

In some cases the compact has been completed, in others only a beginning has been made. The legislation will be found by referring to the 1923 session laws of the states named.

⁸ Ohio, Code, sec. 4366-14, ff.

Pennsylvania, 1923, p. 131.

Hawaii, 1923, no. 150.

See in this connection Wisconsin, Statutes, 1921, sec. 1458-11, passed in 1919; also Platting, below.

⁴ See on this point "The Law of City Planning and Zoning," p. 28, ff.

⁵ See note above.

police power, without compensation, was reasonable, on account of the burden it casts on the landowner. Pennsylvania (1923, p. 801) has inaugurated a method of securing the desired result by the use of eminent domain.

In a number of states statutes have been passed for the fixing of building lines also by eminent domain.¹⁰

A novel excess condemnation statute has been enacted by the state of New York (1923, ch. 170). It empowers the city of Niagara Falls to use excess condemnation in the widening and relocating of parts of its Main Street. Excess condemnation laws are usually passed by virtue of constitutional amendments, there being grave doubts whether statutes which are not so authorized are constitutional. These amendments are sometimes self-executing, sometimes require enabling acts to make them effective. Under some amendments not self-executing general acts may be passed; under others a special act for each improvement must be obtained. The Niagara Falls act is based upon the amendment of the New York constitution which authorizes general enabling laws; but the city has sought and obtained only an act for the special improvement desired. Evidently an amendment which authorizes a general enabling act, if worded as most of the amendments (including the New York amendment) are worded, is also authority for a special act.

Bill-Boards

Unquestionably, popular sentiment against bill-boards often located so as to deface a beautiful landscape or mar the aspect of a city or village street is growing in this country. One manifestation of this fact is the increase of the number of statutes passed to regulate or prohibit advertising in public highways or near parks. There is also a growing appreciation of the danger of signs obstructing the view near railroad crossings. In one state such signs are prohibited, without compensation, on private property. It may be doubted whether the courts will sustain this exercise of the police power. The right to forbid signs on public property is beyond question. A table of the statutes above referred to, passed in 1923, is given below.¹¹

Platting¹²

The statutes in this country for the regulation

of the platting of land are numerous, and have increased during the year. The importance of the subject is so great that a table of the more important laws is given below.¹³

Platting statutes may be divided into two classes. The first class authorizes but does not require the subdivider to record a plat; or, if it does require a plat, makes regulations with regard to it of comparatively small importance. The second class does require the subdivider to record a plat, and it must first be approved by public authority, or there are other substantial prerequisites to record. The difference between the two classes of statutes is fundamental. In the first case, the landowner retains his right to improve his land in full, unless he chooses to file a plat; in the second case he cannot subdivide without filing a plat and thus surrendering his land without compensation to the public for streets, to be laid out with the lots abutting on them in many respects as the public authorities prescribe. I am not aware that the courts have ever passed upon platting statutes of this sort. Hitherto they have distinguished between the regulation of property without compensation, which, within reasonable limits, they have upheld, and the actual taking of property, which they have condemned. The regulation of platting under statutes of this second class is widespread in this country, and there is much to be said, practically and legally, in its favor. In the opinion of the writer, however, the establishment, by proper statutory authority, of a

¹² In this table the statutes in which the filing of plats is optional, or the regulation slight, are starred: Alabama, Code 1907, sec. 6028, ff. Arizona Civil Code, 1913, sec. 1891, ff; 1921, ch. 27. California, Gen. Laws, Act 2065, amended 1923, ch. 163 (p. 878).

*Colorado, Comp. Laws, sec. 9098, ff.

*D. C. Code, 1919, Sec. 1582, 1591, 1601.

*Georgia, Code, 1922, Sec. 4901 (f), (g).

*Connecticut, 15 Spec. Laws, No. 74 (p. 661)—Hartford.

Illinois, Rev. Stats., 1923, p. 571, 988 (tenth) 2634.

Indiana, Ann. Stat., sec. 8696 (fourth), 8900, ff.

*Iowa.

Kansas, Gen. Stats. 1915, ch. 90; ib. sec. 6797, amended 1921, ch. 139; 1921, ch. 99.

Louisiana, Const. and Stat. 1920, p. 1269.

Massachusetts, Gen. Laws 1921, ch. 41, sec. 73-81.

*Minnesota, Gen. Stat. 1913, sec. 6857, 1919, ch. 292.

*Mississippi, Code 1917, sec. 77487, ff.

*Missouri, 1921, p. 509.

Montana, Rev. Codes, 1921, Political Code, Pt. IV, ch. 41.

Nebraska Comp. Stats., 1922, sec. 3502.

*New Jersey P. L. 1912, p. 509, amended 1913, p. 119, New Comp. Stats., 1st Suppt. (1911-15), p. 413, sec. 25-27.

New York, Gen. Munic. L., Art 12-A *New York City, 1916, ch. 513, amending charter, sec. 1540;

Rochester, 1921, ch. 524; *Syracuse, 1913, ch. 370.

Ohio, Code (as amended, 1923) sec. 3580, ff.

*Oklahoma, 1923, ch. 177, ff.

Oregon Laws, 1920, sec. 3807, ff.

*Pennsylvania, Pa. St. (being statutes complete to

1920, West Pub. Co.), sec. 3727, ff, 4381 ff.

South Dakota, Rev. Code 1919, sec. 6537, ff. (See also sec. 5918.)

*Utah, Comp. Laws 1917, sec. 5021, ff.

*Virginia, 1918, ch. 419, amended, 1923, ch. 140.

Washington, Comp. Stats. 1922, sec. 9309.

*West Virginia, Code, 1923, p. 1530.

Wisconsin, ch. 106, sec. 2260, amended 1923, ch. 373; 1923, ch. 304; sec. 1923, ch. 223.

Wyoming.

¹⁰ Minnesota, 1923, ch. 193 amending 1903, ch. 194. Pennsylvania, 1923, pp. 107, 949.

Indiana, 1923, chs. 67, 155, 168.

¹¹ Colorado, 1923, ch. 128.

Iowa, 1923, ch. 91.

Minnesota, 1923, ch. 439, sec. 11.

Missouri, 1923, p. 260.

Nebraska, 1923, ch. 159.

South Dakota, 1923, ch. 206, p. 193.

Utah, 1923, ch. 27.

Washington, 1923, ch. 129 (Code, Suppt., sec. 10510-3, ff.

¹² An interesting article on this subject will be found in the October number of *Landscape Architecture*, by Tracy Baldwin Augur, entitled "The Laws and Regulations Relating to Platting of Land in the United States as Affecting the Desirability of Lots for Dwelling Purposes."

street plan is less drastic and more for the common good;¹⁴ especially in connection with zoning and building-line regulations.

¹⁴In many platting statutes the regulation applies to small areas, sometimes to any land sold. In many cases there is a penalty for the sale or leasing, or offering for sale or lease, of the land before compliance with the statute. The statutes relate sometimes to

the area within certain cities, classes of cities, towns or other municipalities; sometimes also to land outside these areas and within a certain distance of their areas; in a few cases to entire counties or all the land of the state. A few statutes are limited to cases where the planning commission or the governing body of the area in question has adopted a plan. In Montana the subdivider is required, with certain exceptions, to set aside one-ninth of the area for public parks; in Ohio the authorities are forbidden to make any such requirement, and their power is limited in other ways.

How Cities Got Their Names

FOR several weeks the *Dallas News* has been running in its Sunday Supplement articles on "How Texas Towns Got Their Names." An analysis of some of the origins proves of interest. Of the 56 names of Texas cities and towns examined, the following classifications might be made of the sources of our municipal nomenclature:

Locally prominent men, such as pioneers, legislators, railroad officials	16
Soldiers	11
Natural phenomena, such as plains, dales, streams, quality of water, grass, features of landscape, etc.	11
Indian names of tribes, chiefs, natural objects..	4
After other cities of this country or of foreign lands	4
Sentimental or romantic	2
Of a purely fanciful nature.....	1
Religious in origin.....	1
After the father of the Republic of Texas.....	1
After an organization (the Rangers).....	1
After national statesman.....	1
Supplied on request by Post Office Department..	1
Of unknown origin.....	2

A reading of the articles reveals some interesting side-lights on Texas history. Around the naming of some of these places are woven stories of romance and adventure. In one case the winning of a beautiful young bride was involved; in another a searcher after health is rewarded by finding the life-giving mineral waters from which the town derives its name; in another the slaughter of an entire tribe of Indians is commemorated. In one case the name of a wife was honored by the husband;

in another the name of a sweetheart.* In several cases the man in the Legislature who was instrumental in securing the passage of the bill organizing the county in which the town to be named was afterwards located, received the honor.

The conclusion to be drawn from the stories is that the desire of the settlers of these communities was in the main to honor their local leaders, although the war heroes are included in this class, so that there is a probable overlapping of our classification. It can be said, then, that the names of individuals are usually selected for our towns, and that most of these were those of local settlers.

The fact is worth passing notice that the desire to hear oft repeated the name of the place of one's early life is to be assigned as the probable reason for the number of Texas cities that are identical in name with those of the older states and of Europe. A glance over the map of the state would show enough of these to prove that there is some quite strong sentiment along this line.

Comment might be made, too, on the Indian origin of some of the names. Waco, Waxahachie, Tioga, Tehuacana, Quanah, are only a few, but lend a decidedly savage flavor to the cognominal hodgepodge, and bring to mind a day, not so long past, when the problems of municipal government were of minor concern in the body politic.

—From *Texas Municipalities*, November, 1923.

Arbor Day Months

FROM a valuable pamphlet on "Arbor Day" prepared by the Forest Service of the United States Department of Agriculture (Department Circular 265), the following chronological list has been compiled of the months in which Arbor Day is observed in the several states:

January	District of Columbia
Louisiana	Eastern Oregon
February	Idaho
Arizona (Feb. or Apr.)	Indiana
Florida	Maryland
Texas	Massachusetts
Western Oregon	Minnesota
March	Missouri
Arkansas	Nebraska
California	New Jersey
New Mexico	Ohio
Oklahoma	South Dakota
April	Tennessee
Colorado	Utah
Delaware	West Virginia
	May
	Montana

New Hampshire	Spring
New York	Alabama
Rhode Island	Connecticut
Vermont	Maine
Washington	Pennsylvania
Wisconsin	Virginia
Wyoming	Fall
November	Kentucky
Hawaii	By Option of the Governor
North Carolina	Iowa
Porto Rico	Nevada
South Carolina	Kansas
December	North Dakota
Georgia	Illinois
Mississippi (Dec. or Feb.)	Michigan

The pamphlet above mentioned may be secured from the Government Printing Office at 5 cents per copy. It contains much interesting and practical information on the meaning and origin of Arbor Day, the spread of its observance, planting suggestions, the selection and care of trees, and the relation of Arbor Day to the spirit of civic betterment.

The Fire Chief's Cabinet

A Plan for Local Fire Prevention Organizations

By Franklin H. Wentworth

Secretary, National Fire Protection Association

IN every city of the United States and Canada there are men and women who understand the impoverishing effect of the fire waste and would willingly do something towards its abatement. At present these citizens are collectively inactive, principally because they have never been asked to act collectively. Beside these individuals in various walks of life, there are local bodies like chambers of commerce, Rotary, Kiwanis and Lions' clubs, credit men's associations, engineers,' architects' and building managers' organizations, civic and women's clubs, etc. Fire prevention is not their main interest; they are busy with their own affairs. But they are willing to assist in this object if someone will take the initiative and tell them how they can help.

The fire chief is the man to do this, because he is the only one whose interest in this subject is continuous, and the plan is to assemble these local citizens about him as a sort of permanent committee or cabinet which he can call together monthly, or oftener if need be, tell his troubles and outline his plans to make his city fire-safe.

The value of such cooperation is obvious. The fact that these men are in different walks of life is a peculiar advantage, for nobody can charge that any special interest is behind the local fire prevention undertakings. Such a group in any average city will comprise the leading architect, the leading consulting engineer, the leading insurance agent, builder, manufacturer, warehouse man, credit man, department store manager, and so on. Here is an absolutely non-political, friendly, interested body of men, any or all of whom can be depended on to help

the fire commissioner or chief in the right way. Wonderful things can be accomplished by such a group if it has the imagination to see it and the will and energy to effectively project its plans. By persistent efforts it can influence every factor of civic life to advance the city in the direction of its endeavor.

Cities are not made fire-safe in a day. A long background, beginning with proper building construction and following with proper safeguards, is essential. There is hardly a city in the country which would

not be benefited by certain amendments to its building ordinances. The National Board of Fire Underwriters has worked out a building code that takes into account the logical factors of fire-resistive building construction that any city can afford to adopt. This makes a capital handbook for passing on building mat-

ters. This body also makes engineering surveys of cities of more than 20,000 population, showing just where the weak spots in local fire protection are. These reports are available without charge and can be made the foundation for a study of the general situation.

In one city where this plan is already under way, the fire chief's cabinet is to make a survey of the city with special reference to sweeping fires, picking out the buildings that might serve as fire-stops and ascertaining if their window openings are protected either by fire shutters or metal window frames and wired glass. Where such window openings are unprotected, a committee of the cabinet is to call upon the owners with the fire chief and explain the advantage both to the tenants and the city of pro-

Let's Organize and Put Our Knowledge to Work

For twenty-five years engineering efforts have been expended in evolving methods of fighting the fire waste. We have all the technical knowledge anybody needs for fire protection—costly surveys of cities, rules governing hazards, regulations for effective use of fire retardants and devices for fire extinguishment, but we have not yet put into operation any intelligent method of applying this knowledge and making it pay its proper dividend in fire safety.

viding such protection. No good citizen could withstand such a request made in the interest of the common safety. This is just one example of what such a cabinet can do. The down-town, high-value portions of all cities can gradually be made conflagration-proof by such quietly effective work. Reasonable persuasion can often be made more effective than laws. The organization of the fire chief's cabinet should be wholly informal. No articles of association, nor by-laws, nor dues are needed. The fire chief should be chairman, the only officer, although some member may act as secretary if the chief wants such help. New members can be added by the chief at any time.

The time is ripe for just such a plan as this, and all the other agencies, physical and educational, working for fire prevention dovetail logically into it. The cities are

maintaining the most costly and efficient fire departments the world has ever seen, and yet the fire losses last year were over \$500,000,000. What then is the next step? What can be better than a sustained local effort fostered by those citizens of the municipalities who are alive to the significance of the fire waste and the present dire need of the world for its abatement?

The impoverishing effect of the fire waste is national, but every fire is local; it must start somewhere. Local organization and attack is therefore necessary—collective action by men and women who have been awakened, and who are capable of enthusiasm and devotion in eliminating local fire hazards. We must organize these forces already at our command, and begin in each city to use our common sense and abundant technical knowledge.

Fire and Police Departments Cooperate in Controlling Big Blaze



THE FIRE DEPARTMENT OF PROVIDENCE, R. I., FIGHTING A \$500,000 FIRE IN THAT CITY

The remarkably fine work accomplished by the firemen at this time, under the efficient leadership of their Chief, Frank Charlesworth, has been highly praised in a number of letters received by the Department from those who witnessed the scene. All of the city's 420 firemen were on hand, and after a strenuous fight the fire was finally brought under control before it spread to adjacent lumber yards, oil tanks, and coal yards. The Fire Department was considerably aided in its work by the splendid cooperation of the police force. In one instance, fourteen firemen working under the wall of one of the buildings were saved from almost certain death by a policeman who, seeing the wall bulge, blew his whistle and signaled them out of danger before the wall collapsed. Other walls fell, but by good judgment and foresight men were called away before any were injured. About five miles of hose was laid, 38 streams used, and the American-LaFrance pumpers, of which Providence has 14, proved very valuable.

Municipal Motor Equipment



**HOOK AND LADDER TRUCK EQUIPPED BY THE BUFFALO FIRE APPLIANCE CORPORATION
FOR THE LITTLETON, N. H., FIRE DEPARTMENT**

The equipment of this Reo truck includes one 50-foot extension ladder, two 30-foot ladders, one 24-foot ladder, one 16-foot ladder, one 12-foot ladder, two hand extinguishers, two axes, two plaster hooks, eight lanterns, one ceiling remover, one door opener, one search-light and one coat and hat rack. We are indebted to J. O. Mozrall, Fire Chief, for this photograph



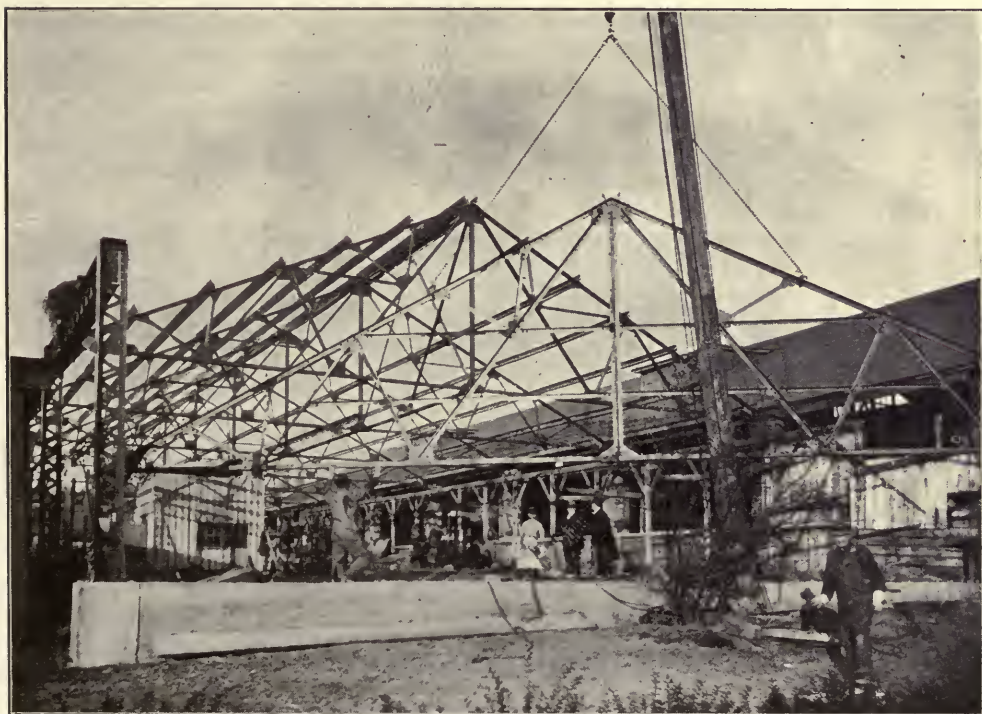
**LADDER NO. 1, A NEW PIECE OF EQUIPMENT FOR THE MANCHESTER, N. H., FIRE
DEPARTMENT**

This Ahrens-Fox ladder carries an 85-foot aerial ladder which is operated by a Dahill pneumatic hoist. There is an air-compressor on the truck so that the truck need not return to quarters to recharge the air tanks. At the upper end of the main ladder is carried a ladder pipe for water-tower service. This truck is of the double-bank type, carrying 321 feet of portable ladders. The outstanding feature of the double-bank construction is the elimination of nesting the ladders. To use the aerial ladder the tiller-man's seat must be swung around out of the way and the tiller wheel removed, but in no case does the steering post have to be removed. A duplicate of this truck and also an additional ladder truck without the aerial will be delivered to Manchester next spring. We are indebted to Charles H. French, Chief of the Fire Department of Manchester, N. H., for this information and photograph



GRADING THE NEW 200-FOOT CONCRETE BOULEVARD BETWEEN DETROIT AND PONTIAC, MICH.

This Universal shovel, mounted on a GMC truck and equipped with a clam-shell bucket, was used in some of the grading work on this new boulevard where steam shovels could not operate. The new boulevard will contain two concrete pavements each 40 feet wide for one-way traffic, replacing the present 16-foot concrete roadway which carries two-way traffic and which has been designated as "the most dangerous highway in America".



ERECTING THE STEEL WORK FOR THE ADDITION TO THE MUNICIPAL GARAGE FOR THE CITY OF ST. LOUIS

The Novo Two-in-One 4-cylinder gasoline-engine-driven compressor was used for the city of St. Louis Repair Section of the Bridge Department for hoisting, erecting and riveting all of the steel work on this garage addition, the work being done by city force account. The equipment was sold to the city by the George F. Smith Company, St. Louis

Chamber of Commerce Activities in Public Affairs

Visualizing the Traffic Problem

SCHENECTADY, N. Y.—Realizing the growing seriousness of the traffic situation in Schenectady, the City Planning Committee of the Chamber of Commerce has made considerable effort to bring about a solution of the problem. As one way of relieving the congestion, the Committee has urged the consideration of the possibility of widening Broadway, one of the main arteries of the city, in the block between two of the principal business streets which acts as the "neck of the bottle" and creates a serious impediment to traffic. A group of interested property owners met with the Committee to discuss the proposition, and they expressed themselves generally in favor of the plan. As a result of this meeting, the matter was taken up by the official City Planning Commission of Schenectady, and an expert in the employ of the Commission is now making a detailed study.

In connection with their work along this line, the City Planning Committee has issued some unusual publicity material. The illustration reproduced herewith was prepared by the Committee to show the steady increase in the number of automobiles in this city since the year 1917, and the number of cars that will have to be provided for in 1930, estimated on the basis of the increase during the past year. The largest percentage of increase in any single year occurred in 1923, when it amounted to nearly 25 per cent. While neither the Chamber's City Planning Committee nor the official

City Planning Commission estimates that this percentage of increase will continue, it is quite probable that an annual increase equal to the number of automobiles added during the past year will occur for several years to come.

BENJAMIN H. BONNAR, Secretary,
Schenectady Chamber of Commerce.

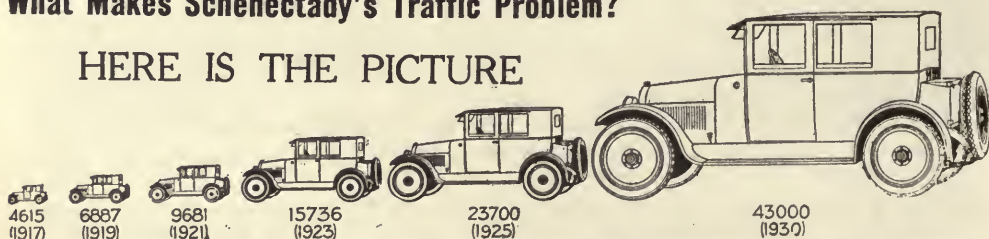
Publicity for Health Department in Chamber of Commerce Bulletin

RACINE, WIS.—As a means of cooperating with the local Health Department, the Racine Association of Commerce recently invited the Department to prepare an article on the subject of "Better Health for the Community," for publication in the *Official Bulletin* of the Association. This was made the principal feature of the January, 1924, issue and occupied the entire front page. In his discussion, Dr. W. W. Bauer emphasized chiefly the need for promoting public health through the educational system, and in the following paragraphs he summarized the services which the Racine Health Department is offering:

"What, specifically, does the Racine Health Department propose to offer the people in the way of education for better health? Assistance to the schools in teaching hygiene and health has been started, and will be increased if the initial effort appears successful. Health books and magazines will be available at the Health Department in the new offices. These cannot be loaned, but may be consulted at the office by any one desiring information. Pamphlets on health, published by the United States Government and various health societies, will be sold at a nominal cost—about fifteen cents each.

What Makes Schenectady's Traffic Problem?

HERE IS THE PICTURE



SCHENECTADY VISUALIZES ITS TRAFFIC PROBLEM, PAST, PRESENT AND FUTURE

Health talks, some of them illustrated, may be had by societies, clubs and schools. Diphtheria prevention, smallpox vaccination, typhoid vaccination, and goitre prevention are now available at the City Hall at 10 A. M. every Saturday. The dental clinic at the McMynn School works every school day from 9 to 12 A. M. The Wisconsin Anti-Tuberculosis Association and the Health Department conduct a chest clinic for tuberculosis prevention on the second and fourth Saturday afternoon of each month. The state venereal disease clinic is located in the Health Department, open every Tuesday and Friday afternoon at 4 P. M. A weekly health review is issued, and any name will be placed on the mailing list upon request.

"These services are costing the taxpayers of Racine about 54 cents per person per year, less than 5 cents per month. If the people will take advantage of them and use them to the utmost, they can be made to pay rich dividends in better community health."

F. H. BARTLETT, Secretary,
Racine Association of Commerce.

Texarkana Goes Forward on Both Sides of the State Line

TEXARKANA, ARK.-TEX.—Two important celebrations, in planning which the Chamber of Commerce cooperated, took place in Texarkana during the latter half of the year 1923. The first of these commemorated the completed paving of State Line Avenue—the avenue which marks the boundary line between the two states, Arkansas and Texas, and the twin cities of Texarkana—and the establishment of a modern white

way along this thoroughfare. The second celebrated the fiftieth anniversary of the founding of the cities of Texarkana.

For a number of years State Line Avenue has been paved only on the Texas side of the line, the street improvement program of Texarkana, Ark., having been long delayed because of the intervention of the World War, lawsuits involving rights of contract, etc. When the paving of the remaining half of the avenue was finally accomplished in 1923, and the white way established, it was felt that the city had taken a forward step worthy of celebration. A program of speeches and music was therefore planned for the evening of September 14 and at that time more than 15,000 people gathered in the center of the business district on State Line Avenue to participate in the event. One of the most distinctive features of the program was the exemplification of the spirit of cooperation and unity existing between the citizens of the two cities. Over the avenue were hung in huge electric lights the words "Texas" and "Arkansas," on either side of the state line. As the evening's program concluded, the letters of the two words slowly merged into the word "Texarkana," and the mayors of the two cities joined hands across the geographical boundary line.

On December 8, 1923, the cities of

Texarkana completed the first half-century of their existence, and the week beginning December 3 was set aside for commemoration of the Golden Jubilee. A program of floral and float parades, pageants, band and choral concerts, etc., was planned, which lasted throughout the entire week. An exposition of merchandise and local products and an automobile show were also arranged. On December 6 Governor Neff of Texas and Governor McRae of Arkansas were the guests of the cities and, following a banquet at noon, the two governors addressed the crowd of over 6,000 people who had



GOVERNOR MCRAE OF ARKANSAS AND GOVERNOR NEFF OF TEXAS SHAKING HANDS ACROSS STATE LINE AVENUE, TEXARKANA

This street is 100 feet wide, and its middle line divides the two states, the two counties and the two cities

gathered for the occasion. The accompanying illustration shows the state executives clasping hands across the state line, signifying again the bond of friendship between the two municipalities.

M. E. MELTON, Secretary.
Texarkana Chamber of Commerce.

Memorial Park Presented to Village by Chamber of Commerce Director

ILION, N.Y.—A tract of beautiful woodland covering 160 acres, with rolling hills, brooks and other natural advantages which help to make an ideal municipal recreation ground, has been presented to the village of Ilion for use as a park, by Samuel T. Russell, one of the directors of the local Chamber of Commerce, in memory of his father. Albert N. Russell, the father of the donor, for whom the park is named, was a resident of Ilion for over fifty years, active in all public enterprises and a prominent business man. He was the leading member of the Ilion Board of Water Commissioners from the time of its inception until his death in 1913.

For many years the donor has been one of the leading business men of the community and closely identified with the development of the local commercial organizations. He served as the first president of the Ilion Board of Trade after its organization in 1897 and was prominent in the organization of its successor, the Ilion Chamber of Commerce, in 1920.

The park is situated immediately southeast of the most thickly populated section of the village and within ten minutes' walk of the civic center, and motor approach by easy grades is possible by several routes through the eastern and southern sections of the community. The topography of the site offers opportunities for the construction of scenic drives, several small ponds, athletic grounds and other attractions. Picnic tables have been erected beneath the trees, and these were well used during the past summer months. The Ilion Fish and Game Club has already planted several hun-



Photograph by George W. Thompson, Ilion, N. Y.

VISTA IN ILION'S MEMORIAL PARK

dred pine trees and has asked permission to stock the ponds with fish and to make the park a game refuge and breeding place for small game and wild fowl, believing that as the park becomes congested the game will make their way to the near-by woods and fields.

It is proposed to develop the park according to a definite predetermined plan extending over a number of years, and steps are being taken by the Board of Trustees of the village to secure an amendment to the village charter permitting the appointment of a Park Commission and granting authority for the appropriation of the necessary funds for park development. If the plans now under way are carried out, Ilion will ultimately possess one of the finest natural parks to be found in any community.

WILLIAM E. BEST,
President, Chamber of Commerce, Inc.

Employment Bureau for Students

SIoux CITY, IOWA.—At the suggestion of the service clubs and other organizations of the city, the Sioux City Chamber of Commerce has opened an employment bureau for students who desire work during their spare hours. A list has been compiled by the Chamber of all students who would welcome an opportunity to earn some additional income, together with a record of the kind of work for which they are best fitted. Employers in need of a boy for extra work or for a permanent part-time

job are urged to get in touch with the employment bureau. It is hoped that the services rendered by the bureau will result in a considerable increase in the enrollment of the secondary schools.

HARRISON KILBORNE,
General Secretary, Sioux City Chamber of Commerce.

Encouraging the Planting of Trees, Shrubs and Plants

TOLEDO, OHIO.—The City Beautiful campaign conducted last spring by the Toledo Chamber of Commerce proved to be the most successful campaign of its kind ever held in this city, and the following outline may therefore contain helpful suggestions for other organizations contemplating similar activities during the coming season.

Early in the spring a citizens' committee, composed of representatives of all local organizations, was appointed by the Chamber to take charge of the arrangements for the campaign. The committee proceeded to plan its activities with the thought in mind that while considerable effort had been made in the past along educational lines to further the cause of city beautification, no plan had ever been adopted whereby the sale of trees and shrubs might be facilitated.

One of the first steps taken was to secure the cooperation of one of the largest nurs-

ery companies in this vicinity in establishing public display and sales grounds in several of the city parks. By this means the large number of people constantly driving or walking through the parks were interested in the exhibits, and in all 29,740 trees, shrubs and plants were sold through these sources at a total cost to the purchasers of \$7,057.12. Splendid cooperation was also secured through the public schools. Orders for trees and shrubs were taken in the classrooms, a total of over 3,000 elm and fruit trees being distributed in this way. The newspapers devoted liberal space to the campaign, and motion picture theaters assisted.

In addition to encouraging the planting of trees, the Committee gave considerable attention to the subject of school children's gardens. In this connection a contest was arranged in which over 1,200 school children participated. Every garden was visited by the committee of judges, and suitable prizes were awarded to the owners of the prize-winning gardens.

The results of the campaign last year were so encouraging that plans are now being made for a repetition of the activity during the coming spring.

J. G. MACKENZIE, Assistant Secretary,
Toledo Chamber of Commerce.

Good Citizenship and Public Office

By Theodore Roosevelt

IT ought to be axiomatic in this country that every man must devote a reasonable share of his time to doing his duty in the political life of the community. The people who say that they have not time to attend to politics are simply saying that they are unfit to live in a free community.

The first duty of an American citizen is that he shall work in politics; his second duty is that he shall do that work in a practical manner; and his third is that it shall be done in accord with the highest principles of honor and justice. Each man's individual temper and convictions must be taken into account. To a certain extent his work must be done in accordance with his individual beliefs and theories of right and wrong. To a yet greater extent it must be done in combination with others, he yielding or modifying certain of his own theories and beliefs so as to enable him to stand on a common ground with his fellows, who have likewise yielded or modified certain theories and beliefs.

There is every reason why a man should have an honorable ambition to enter public life, and an honorable ambition to stay there when

he is in; but he ought to make up his mind that he cares for it only as long as he can stay in it on his own terms, without sacrifice of his own principles; and if he does thus make up his mind, he can really accomplish twice as much for the nation and can reflect a hundredfold greater honor upon himself, in a short term of service, than can the man who grows gray in the public employment at the cost of sacrificing what he believes to be true and honest. And moreover, when a public servant has definitely made up his mind that he will pay no heed to his own future, but will do what he honestly deems best for the community, without regard to how his actions may affect his prospects, not only does he become infinitely more useful as a public servant, but he has a far better time. He is freed from the harassing care which is inevitably the portion of him who is trying to shape his sails to catch every gust of the wind of political favor.

From a speech delivered (at the age of 34) before the Liberal Club of Buffalo, January 26, 1893, and recently made available by the Roosevelt Memorial Association.



RECEPTION OF NEW CITIZENS, PORTLAND, ORE.

A Washington's Birthday Suggestion

By Cathrine A. Bradshaw

Executive Secretary, Portland Americanization Council, Portland, Ore.

ON February 22, 1924, the Portland Americanization Council will for the third successive year hold a public reception to the newly naturalized citizens of the city. Would not the general adoption of this method of celebrating Washington's birthday be the best possible means of honoring the nation's first President?

The accompanying picture shows a part of the audience at the second annual reception to naturalized citizens, held February 22, 1923, in the city auditorium, when more than 700 men and women came into their United States citizenship. The service made a deep impression on these "citizens by choice"; and anyone in the audience so fortunate as to be born into United States citizenship was helped to appreciate more fully his native rights. Each new citizen was given a beautiful American flag and by this flag was known wherever he sat with his family in the great hall.

The funds of the Portland Americanization Council come from the Community Chest, our annual budget being but \$3,000. It has been demonstrated, however, that much can be done by volunteer effort. The first undertaking of the Council was to make a city-wide survey to ascertain the nationality and residence of all foreign-born and native-born of foreign parents. More than a thousand women cooperated in this survey. Every affiliated organization, and many federated women's clubs, 78 in number, appointed an Americanization captain and that captain produced a team of workers from her organization and agreed to cover a certain portion of the city.

Not only did the caller ask questions, but

in every instance an endeavor was made to make the aliens feel the friendliness that prompted the call. They were told where to find the nearest night school and were invited to go there and learn English free; and at the same time helpful inquiries and suggestions were made regarding housing, sanitation, need of medical attention, visiting nurse, etc.

After the completion of this survey, nineteen classes were organized in group centers, volunteer teachers were put in charge, and free text-books were given to students, has been excellent and enthusiasm well no other entrance requirement or expense than "interest." This class work now numbers 23. The attendance of the classes has been excellent and enthusiasm well maintained. The paid public night school classes which were being held by the school board were increased in enrollment over 250 as a direct result of the city survey.

Americanization work in the local industrial plants is also an outgrowth of the survey. Noonday classes were organized in the factories and are taught and directed by plant employees. The industry not only gains in labor efficiency, but helps to promote better citizenship by this Americanization activity.

Jointly, the University of Oregon and the Portland Americanization Council conducted a six-weeks summer session for the training of Americanization teachers, for the purpose of putting more trained workers into the field. Thirty-eight students received Americanization teachers' certificates last year, and an increase in matriculation is assured for this summer's course.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Right of Cities to Regulate Noises and Odors

JUDICIAL precedents upholding the power of cities to enforce regulations against noises which disturb inhabitants, and against odors which threaten their comfort or health, show that the authority is a broad one. If the regulation has any reasonable tendency to promote the public health, peace or welfare, its validity safely may be assumed.

Generally speaking, noises or odors which may be prohibited in cities are such as constitute nuisances. As declared by the Illinois Supreme Court in the case of North Chicago City Railroad Company vs. Lake View, 105 Illinois Reports, 207:

"Nuisances may thus be classified: first, those which in their nature are nuisances *per se* or are so denounced by the common law or by statute; second, those which in their nature are not nuisances but may become so by reason of their locality, surroundings or the manner in which they may be conducted, managed, etc.; third, those which in their nature may be nuisances, but as to which there may be honest difference of opinion in impartial minds. The power granted by the statute to the governing bodies of municipal corporations to declare what shall be nuisances and to abate the same, etc., authorizes such bodies to conclusively denounce those things falling within the first and third of these classes to be nuisances, but as to those things falling within the second class the power possessed is only to declare such of them to be nuisances as are in fact so. With these distinctions kept clearly in view no difficulty will be found in harmonizing the decisions in question."

The West Virginia Supreme Court of Appeals has ruled that a merry-go-round constitutes a public nuisance on proof of its noisy operation by a steam-engine, with the whistle blowing every few minutes, and accompanied by a band, and attended by a boisterous assemblage, disturbing near-by residents. (21 Southeastern Reporter, 906.) And it has been ruled that such drum-beating and horn-blowing as were more commonly resorted to in the past by the Salvation Army are subject to mu-

nicipal restraint. (47 Pacific Reporter, 1074.)

Scores of decisions of courts of last resort attest the right of a city to legislate against the establishment of noise-producing industries in residential sections. Examples of such industries are marble yards, rock-crushing plants, boiler factories, etc. Says a standard legal authority:

"Mere noise may be a nuisance, if it be of such a character as to be productive of actual physical discomfort and annoyance to a person of ordinary sensibilities, and this although such noise may result from the carrying on of a trade or business in a town or city. But as many useful acts are necessarily attended with more or less noise, reasonable noises in an appropriate locality are not necessarily nuisances, even though they are disagreeable and annoying." (28 Cyc. 1185-1186.)

The law reports show that the sense of smell more frequently invokes the legislative powers of cities than does the sense of hearing. And the power to promote individual comfort, as well as public health, by suppressing means of producing and disseminating offensive odors, has been recognized in hundreds of decisions which seem to run the whole range from ill-smelling cheese to the most disgusting effluvia. A mild example is afforded by an ordinance of the city of Pasadena which forbids the keeping of a goat within 50 feet of another person's dwelling-house. If more than two goats are kept, the limit is 100 feet; more than four, 300 feet; more than five, 1,000 feet. In the case of Mathews, 214 Pacific Reporter, 981, the validity of the ordinance was unsuccessfully assailed. In the course of an extended comment upon the scope of the police power in such matters, the California Supreme Court said:

"It is a matter of common observation that the herding together of even the least offensive animals within a city may be conducive to noise, foul odors, and insect life, and may be a



The Public Demands Action

* * *

In progressive cities throughout the Eastern and Northern states, Chambers of Commerce and other public bodies are much concerned in the program of snow removal, as they realize what losses can be caused by snow blockades even if lasting only for a few days. How successfully and economically "Caterpillar" methods combat snowfall is proved by the following statements.

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source of great annoyance and discomfort to persons residing in the vicinity. Assuming it to be a fact of which we may take judicial notice that female goats are, as claimed by petitioner, animals of high qualities, whose merits are underestimated by the public at large, still they might not be entirely free from all the characteristics which make other barn-yard animals the proper subject of municipal regulation. We cannot say that when kept in numbers in a city they are so incapable of offending the senses and affecting the health and comfort of the residents, and, in the instance before us, are so unlikely to interfere with the public welfare, that they are beyond the power of regulation of a city government."

In a Louisiana case (79 Southern Reporter, 542), the Supreme Court of that state sustained the validity of an ordinance preventing the location of undertaking establishments in residential districts, despite a finding that emission of offensive odors on account of decaying human bodies might be occasional only. The Court observed that "a single experience of air so laden would . . . more than satisfy the average individual for the period of his natural life, and fifteen minutes would be quite long enough for the experience." It was further remarked that where "in cases involving the suppression of nuisances, witnesses testify that a stench emitted from a particular establishment, no one thinks it necessary

to prove that it is unpleasant or nauseating to the vast majority of those whom it reaches, and who, not being employed in the establishment, have not become inured to it. The courts, we think, may safely take it for granted that, with rare exceptions, civilized human beings are in a greater or less degree made uncomfortable by foul odors."

Particularly well established is the right of a city to minimize annoyance and avoid health perils on account of decaying filth, garbage and refuse. "Under its power not only to abate, but to prevent, nuisances, a municipality may by contract provide for removal, or may require owners to care for or remove garbage, offal, and filth, or to deposit the same at stated times and places for removal by employees; and it may prescribe the times and mode of removal and disposition, forbid removal by unlicensed persons, and give a monopoly thereof by contract for a period of years." (29 Cyc. 717-718.)

The municipal power to prevent establishment of noisy industries in residential districts meets an analogous power to prevent establishment in such districts of noisome industries, such as slaughter-houses, fertilizer factories, soap-boiling plants, etc.

Sundry Items of Municipal Law

City Held Liable for Injury Negligently Inflicted by Water-Works Guard

Defendant city was not entitled to avoid liability for negligent shooting of plaintiff by a guard at a water-works reservoir on the ground of municipal immunity from liability in the performance of governmental functions, holds the Connecticut Supreme Court of Errors in the case of *Richmond vs. City of Norwich*, 115 Atlantic Reporter, 11. The Court said:

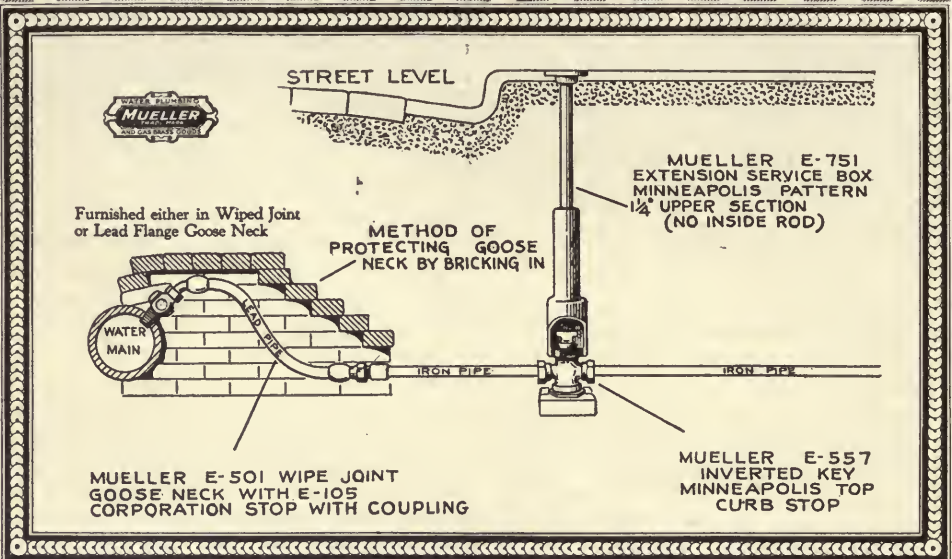
"When a municipality is engaged in the performance of a public duty for the public benefit, and not for its own corporate profit, it will be immune from liability for injuries done in the performance of such acts. The defendant city was not engaged upon such a duty at the time the plaintiff suffered her injuries. In collecting, distributing and vending water it was engaged in the performance of acts done in the management of its property or rights for its own corporate benefit or profit, and that of its inhabitants, and for injuries caused by it through its negligent acts it cannot plead governmental immunity. So that, upon the conceded facts in this case,

the question of governmental immunity did not arise in the case."

Constitutional Limitation of Taxation for City Purposes Includes Taxes Levied for Educational Purposes

The clause of the New York constitution limiting annual taxation for "city purposes" to 2 per cent of the assessed valuation of taxable property covers taxes levied for educational purposes, holds the New York Supreme Court for Monroe County in the case of *Board of Education of City of Rochester vs. Van Zandt*, 195 New York Supplement, 297. In the course of its opinion the Court remarks:

"For nearly 40 years the cities of the state have construed the section to include taxes levied for educational as well as for other state functions. Education is a state function, but so is fire, police, and health protection and public charity. No question has been heretofore raised as to the inclusion of taxes for any of those purposes in the 2 per cent limitation. On the contrary, it has been assumed for nearly four decades by those having



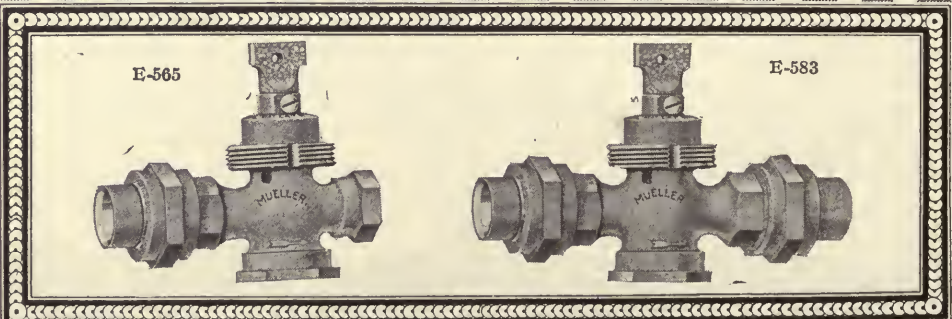
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the power to levy taxes in cities that 'city purposes,' as used in the section, includes all taxes which the city may legally impose."

Right of Abutting Property Owner to Use Portion of Street for Temporary Deposit of Material

The right of one whose place of business abuts upon a street to use the street temporarily as a place for the deposit of goods was recognized by the Missouri Supreme Court lately in the case of *Searcy v. Noll Welty Lumber Co.*, 243 Southwestern Reporter, 318.

Defendant delivered a load of coal to a customer, depositing it near the curb in the street in front of the customer's premises. This occurred in the afternoon. After dark that evening plaintiff was injured through driving his automobile into the coal, which had been left without warning lights, in violation of an ordinance of the city (Kansas City).

Holding that defendant was not liable for the accident, the Court declared that the defendant's customer had the right to use the street for temporary deposit of the coal. This right grew out of his rights of access to and from the street as an abutting property owner or occupant. And, since the defendant's customer had the right to make use of the street, it is held that defendant had a right to do it for him; assuming that it was not negligently piled and did not unreasonably obstruct the street.

However, the opinion recognizes that "notwithstanding the right of an abutting proprietor to temporarily occupy a portion of the street when necessary, municipal authorities may impose reasonable conditions upon such use." On the other hand, it is decided that an ordinance requiring materials, etc., piled in a street to be inclosed by barriers and have warning lights posted imposes a duty against the abutting property owner and not against one delivering the materials for him. The latter is under no obligation to see that the barriers and lights are posted.

An Ordinance Forbidding Gasoline Filling Stations Held to Be Void as Being Unreasonable

The city of Fremont, Nebr., adopted an ordinance purporting to forbid the establishment of filling stations along the principal street for a distance of thirteen blocks. But in the case of *Standard Oil Co. vs. City of Kearney*, 184

Northwestern Reporter, 109, the Supreme Court of the state finds that, considering the circumstances, the regulation is void as being arbitrary, unreasonable and discriminatory. In part, the opinion reads:

"We are convinced that the slight inconvenience to pedestrians by motor vehicles crossing the sidewalk is not of sufficient magnitude to justify the ordinance on that ground. The automobile as a business and pleasure vehicle has come to stay, and the rights of users, who constitute a considerable part of the public, must also be considered in determining the validity of ordinances of this nature. Besides this, within one block from the plaintiff's premises, and within the district, is a public garage, access to which is had across the sidewalk. It is conceded that the ordinance does not prohibit crossing the sidewalk to enter the garage.

"We think the real reason for the ordinance is set forth in the defendant's answer, wherein it is charged that the construction of an oil-filling station on the principal street of the city would be an 'everlasting eyesore and disgrace.' While great latitude must be given to municipalities in the matter of the exercise of police power, it must not be carried to the extent that it is unreasonable, arbitrary, or discriminatory."

City's Power to Accept Gift of Building for Library Purposes

If authorized by its charter or by statute, a city validly may accept gift of a building to be used perpetually as a public library. (*Borough of Clarion vs. Central Savings Bank & Trust Company*, 208 Pacific Reporter, 251, decided by Colorado Supreme Court.

Courts May Not Question Wisdom of Local Improvement Projects

Sustaining the validity of paving proceedings incidentally involving special assessments against benefited property on account of the cost, the Iowa Supreme Court said in the case of *Illinois Central Railroad Company v. Incorporated Town of Pomeroy*, 194 Northwestern Reporter, 913:

"It may be that the improvement has involved a greater expense than should be borne by this small town. But it is not for the Court to say what improvements shall be constructed in any town. The Legislature has given cities and towns authority to construct improvements. In fact, country roads are being paved, making such roads substantially the same as the streets of cities and towns."

For information on CITY PLANNING AND ZONING LAW see article by Frank B. Williams on page 188, and Zoning Notes, page 207.

Fullerton Parkway, Chicago, Ill., Tarvia-built 1909. Note excellent condition of street after fifteen years of uninterrupted service.



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Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources
For further information, Mr. Williams may be addressed in care of
THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Recent Zoning Ordinances

ASBURY PARK, N. J.—Ordinances, November 23, 1920, December 14, 1923.

BRADLEY BEACH, N. J.—Ordinance, December 11, 1923.

WATERTOWN, N. Y.—Ordinance, July 17, 1922.

MADISON, OHIO.—Ordinance, October 9, 1923.

CRANSTON, R. I.—Ordinance, January 18, 1924.

Recent Zoning Decisions

CALIFORNIA.—A decision adverse to certain clauses in a zoning ordinance applicable to Los Angeles has been rendered by the Second District Court of Appeals. No copy of the decision has as yet been received. The ordinance attacked was not the comprehensive ordinance adopted in 1921, but an earlier ordinance applying only to a section of a particular street. As so often occurs, the decision was reported in the daily newspapers to be the overthrow of zoning in California. This it evidently is not. The point decided seems to be with relation to rules splitting up residential areas into districts in which the number of families per house is differently limited. While these finer distinctions are to be found in many ordinances, many city planners have long felt that there was grave doubt of their legal validity.

MARYLAND.—The *Baltimore News* of December 27, 1923, reports a decision by Judge Charles W. Heusler, in the Superior Court, in which one Daniel Goldman was plaintiff, sustaining the Baltimore zoning ordinance, and declaring it constitutional. The Judge expressed his approval of the ordinance in vigorous language. There was no written opinion.

NEW YORK.—Matter of Kelmonson and ano. The decision of the Supreme Court in this case, reviewed in our November "Notes," has been reversed in the Appellate Division, Second Department.

OHIO.—*Ambler Realty Co. v. Euclid Village*, before Judge Westenhaver, Federal Court, Cleveland. This case, recently tried, in which no decision has as yet been rendered, has been the subject of comment because of the fact that it is in a United States Court, although in such matters the Federal Courts follow the state law. The point at issue seems to be the reasonableness of the provision in the village ordinance zoning land near a railroad for residence. The zoning of such areas is often a difficult problem, and the decision of the Court is awaited with interest.

State ex rel. Danzig v. Durant, Building Inspector of the City of Lakewood, Court

of Appeals, Cuyahoga County, December 13, 1923. Mandamus to compel the building inspector to issue a permit for the construction of an apartment house for more than two families, under a comprehensive ordinance, in a district limited by the ordinance to residences for not more than two families. Held that the ordinance is constitutional and the provision in question, under the circumstances, reasonable and valid.

The Court states that, in its opinion, the weight of authority in the United States is against the constitutionality of zoning ordinances, which would seem not to be warranted by the decisions. The Court, however, goes on to say that under the statutes and constitution of Ohio such ordinances are constitutional. The ordinance in question is No. 1786, repealing a former ordinance, 1479. A later ordinance, No. 2073, had been passed, which does not affect the relator in this case. The Court states that in its judgment this ordinance is, under the circumstances, discriminatory and unfair; but that this fact does not affect the whole plan or the rights of the relator; and therefore leaves the original enactment in full force.

WISCONSIN.—State ex rel. Carter v. Harper, Building Commissioner of the City of Milwaukee. Mandamus to compel the issuance of a building permit. The relator is in the wholesale and retail milk and dairy business. In 1919 he purchased a lot and erected thereon a building which he is using as a dairy and milk pasteurizing plant. During 1921, he found that his trade had outgrown the capacity of his plant to such an extent that it became impossible for him to conduct his business in the building in accordance with city and state health regulations, and applied for a permit to construct an addition to his building. The application was denied because the proposed addition was violative of the Milwaukee zoning ordinance.

The Milwaukee ordinance establishes four districts—residence, local business, commercial and light manufacturing, and industrial. Relator's property is within a residence district. The ordinance also provides that no building devoted to a non-conforming use shall be enlarged unless the use is changed to a conforming use. Held that the ordinance is constitutional, and the provision in question reasonable. The relator, limited in the use of his property, finds compensation therefor in the benefits accruing to him from like limitations imposed upon his neighbors. Regulations to promote the public convenience or the general welfare are within the police power. The

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—And These You Have in the Bear

AS ONE man said, "It seems the Bear is *specially made* for nearly *every* job." The truth is, practically *every* feature in the Bear is of advantage in *every* kind of tractor work. So, while the Bear is termed a *universal* tractor, most Bear owners feel that it was designed *especially* for them.

And no where is this feeling more pronounced than among the men who are doing road patrol work. If all your other tractor work were eliminated from consideration, it is doubtful if a better tractor could be built at the present time for road patrol.

Not only is the Bear *fast*, not only is it *quick at the turn*, not only is it *easy to control*—but it supplies *cheap* power, whether pulling a half load or a full load. Its power flexibility, its efficiency in delivering its power to the drawbar, its economy in fuel and oil consumption, its low up-keep as illustrated in the track—these are some of the reasons *why* the Bear supplies cheap power for road maintenance.

It will cost you nothing to learn a lot more about the Bear Tractor. A book, just published, will be sent to you on request.

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The Tractor that Delivers its Power to the Drawbar

weight of authority in this country is in favor of the constitutionality of comprehensive zoning regulations. The Court reviews and com-

ments at length upon the decisions in the various states on the subject. The decision is one of the best that has as yet appeared.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

THE total of municipal financing negotiated during the month of January will approximate \$65,000,000, as against an average of \$100,000,000 a month during the final quarter of 1923. This reduction in the volume of flotations was in keeping with the condition of the market for such bonds, which was dull but firm. One of the largest flotations of the month was an issue of \$4,200,000 city of Rochester, N. Y., bonds. These bonds were 4¼'s and were sold at a premium which brings the net interest rate down to 4.17 per cent.

In view of the confused tax-exempt bond situation caused by the threats of adverse legislation coming out of Congress during recent weeks, it is felt that the municipal bond market, as illustrated by this Rochester sale, has shown remarkable strength. The explanation of the steadiness of tax-exempt bond prices lies in the fact that, at current selling prices, tax exemption really plays a minor role. State and city bonds depend in reality upon the demands of the conservative institutions and the great body of smaller investors seeking absolute security. These buyers have always been the real support of the municipal bond market, and, in vastly increased numbers, are again keeping the price level substantially above that at which

less secure and, incidentally, taxable securities are available.

As indicated by the important municipal financing listed below, the prices have improved slightly since last month, along with the general bond market:

IMPORTANT MUNICIPAL BONDS SOLD DURING JANUARY

Amount	Borrower	Maturity	Coupon Rate (%)	Net Yield (%)
\$4,200,000	Rochester, N. Y.	1925-54	4¼	4.17
500,000	White Plains, N. Y.	1934-58	4½	4.19
2,000,000	Providence, R. I.	1964	4¼	4.33
1,150,000	Tonawanda, N. Y.	1926-53	4½	4.41
2,500,000	St. Paul, Minn.	1925-54	4¼ & 4½	4.42
250,000	Flint, Mich.	1924-54	4½ & 4¾	4.62
425,000	Sioux City, Iowa	1932-44	4¾	4.67
633,800	Grand Rapids, Mich.	1926-43	4½ & 5	4.70
561,000	South Orange, N. J.	1924-64	4¾ & 5	4.61-4.82
706,000	San José, Calif., High Sch. Dist.	1924-44	5	4.84
3,600,000	Pueblo Cons. Serv. Dist., Colo.	1926-55	5	5.38

Has Your State a City-Planning Organization?

IN compiling the following list, reference has been had to the files of THE AMERICAN CITY, to the list appearing in Theodora Kimball's "Manual of Information on City Planning and Zoning," and to the records of the National Conference on City Planning.

THE AMERICAN CITY will greatly appreciate information from readers as to state organizations for city planning which may be functioning in states other than these listed. Are there any such?

STATE ORGANIZATIONS FOR CITY PLANNING

California Conference on City Planning

Pres., Judge Albert Lee Stephens, Los Angeles, Calif.

Sec'y, Charles H. Cheney, Redondo Beach, Calif.

Commission of Immigration and Housing of California

Pres., Simon J. Lubin, Sacramento, Calif.

Sec'y, Paul Scharrenberg, 525 Market Street, San Francisco, Calif.

Indiana State Conference on City Planning

Sec'y, John B. Reynolds, Chamber of Commerce, Indianapolis, Ind.

Iowa Town Planning Association

Pres., William Gorden, Sioux City, Iowa

Sec'y-Treas., Rolland S. Wallis, Ames, Iowa

Massachusetts Federation of Planning Boards

Chairman, Horace B. Gale, Natick, Mass.

Sec'y, Arthur C. Comey, Abbot Building, Harvard Square, Cambridge, Mass.

Commission of Housing and Regional Planning (New York) in State Department of Architecture

Chairman, Clarence S. Stein, New York, N. Y.

Director of Investigations, George Gove, 949 Broadway, New York, N. Y.

Ohio State Conference on City Planning

Pres., John E. McCrehen, 145 E. State Street, Columbus, Ohio.

Sec'y-Treas., Charlotte Rumbold, 201 Chamber of Commerce Building, Cleveland, Ohio

Association of City Planning Commissions of Cities of the Third Class in Pennsylvania

Chairman, Jesse S. Bell, Williamsport, Pa.

Sec'y, Leo J. Buettner, Johnstown, Pa.

Pennsylvania Housing and Town Planning Association

Pres., A. B. Farquhar, York, Pa.

Sec'y, Frederick Bigger, 707 Westinghouse Building, Pittsburgh, Pa.

Division of City Planning and Municipal Engineering in Pennsylvania State Bureau of Municipalities

Chief, B. A. Haldeman, Harrisburg, Pa.



After snow removal - *what?*



Year 'Round

usefulness is one of the advantages of Best Tractors explained in our book, "The Open Road." The subject of snow removal is covered in a way to interest every public official.

Your copy of this book is ready. Just send for it.

WHILE the snow flies, your Best Tractor is busy keeping streets clear so that the normal life and business of the city need not be thrown into disorder.

When the season of snow removal is past you have useful equipment for other tasks, because Best Tractors know no seasonal limitations. The power that carried your Best through heavy snow drifts will pull scarifiers, scrapers, graders, etc., and handle the other tough jobs you have in the same dependable fashion.

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BEST TRACTORS

Hints, Helps and Happenings

Per Capita Costs Increase As Cities Grow

NEW evidence is available in a statement released December 28 by the Department of Commerce that the growth of a city in population is almost inevitably accompanied by a higher tax rate per capita. According to reports made by the cities of 30,000 and over, the total cost of government in 1922 of these 261 cities amounted to \$2,222,566,519, or \$57.38 per capita. The largest cities, having a population of 500,000 and over, show the highest per capita cost, \$66.88. The next highest per capita \$64.29, is shown for cities with a population of 300,000 to 500,000. The per capita cost of cities from 100,000 to 300,000 amounted to \$48.71. The per capita cost of cities from 50,000 to 100,000 was \$44.94. The cost in the small cities, having a population of 30,000 to 50,000, shows the lowest per capita, \$44.38.

Comparable statistics are shown for 199 of the principal cities, and in these the per capita cost has increased from \$34.68 in 1918 to \$58.07 in 1922.

An analysis of the costs of the city governments shows that the per capita cost for maintenance and operation of general departments was the principal item and amounted to \$33.15, consisting of \$2.94 for general government, \$6.66 for protection to person and property, \$3.25 for health and sanitation, \$2.87 for highways, \$2.08 for charities and corrections, \$12.50 for schools, \$0.41 for libraries, \$1.09 for recreation, and \$1.34 for miscellaneous purposes; for maintenance and operation of public service enterprises; such as water-works, electric light plants, markets, and similar enterprises, the per capita was \$2.75; for interest on debt, \$5.52 per capita; and the per capita cost of permanent improvements was \$15.95, including \$3.30 for public service enterprises.

Street Improvements by Special Assessment

STRIKING testimony to the economic soundness of financing street improvements by special assessment on the property benefited is afforded by the recent action of a group of taxpayers on Sixth Avenue, New York. The removal of the old elevated railway and the construction of a four-track subway along its route from the Battery to Fifty-ninth Streets has long been regarded as a desirable improvement, but one which, because of more urgently needed transit construction elsewhere, could hardly be financed out of city funds. On December 10 Borough President Julius Miller submitted to the Board of Estimate and Apportionment a petition already signed by the owners of more than \$20,000,000 of property on Sixth Avenue urging that the proposed im-

provement be made and suggesting that the entire cost of the subway construction and of removing the elevated structure be borne by the abutting property. On February 1 signatures had been secured from owners of over \$70,000,000 of property, and others are expected to join the movement in a short time. The assessed value of all the property along the whole route is about \$260,000,000, and the cost of the improvement, which thus would be undertaken without expense to the city, is more than \$25,000,000.

Advertising Signs Now Prohibited on Public Highways in Minnesota

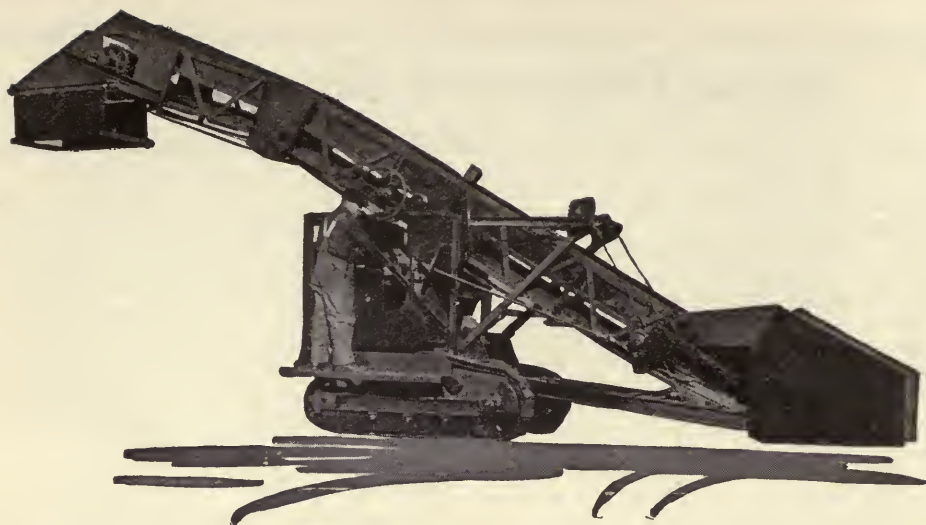
ON December 1, 1923, there went into effect in Minnesota an act of the 1923 Legislature for the removal of signs from public highways, the provisions of which are as follows:

"Any person who in any manner places, puts or maintains any advertisement within the limits of a public highway, or who in any manner paints, prints, places, puts or affixes, or causes to be painted, printed, placed or affixed any advertisement on or to any stone, tree, fence, stump, pole, mile-board, mile-stone, danger-sign, danger-signal, guide-sign, guide-post, bill-board, building, or other object within the limits of a public highway, shall be guilty of a misdemeanor; provided, however, that none of the provisions of this act shall prohibit the placing of public notices on bill-boards erected for that purpose by authority of the governing body of a municipality. Any advertisement in or upon a public highway in violation of the provisions of this subdivision may be taken down, removed, or destroyed by direction or authority of the commissioner of highways in the case of state trunk highways, by the county board in the case of county and state aid roads, and by the town board in the case of town roads."

Growing Scope of the Clean-up and Paint-up Movement

STARTED originally as a springtime method of cleaning up the winter's accumulation of rubbish and litter, and brightened up later by the application of some paint, the "Clean-up and Paint-up" campaign movement has had a development, both in time and scope, which has meant much for civic improvement. Growing emphasis is placed, not on a "day" or "week," but on a real campaign kept up as long as may be necessary to do a worth-while job. The activities promoted and benefits resulting are thus summarized by R. W. Emerson, in a recent letter to THE AMERICAN CITY:

"Fire losses are reduced through the removal of waste and rubbish in attics, cellars, warehouses, storerooms and other places. Fire-traps are razed, and often replaced by modern buildings. Streets are cleaned and repaired. Vacant grounds are improved by the removal of rubbish and by their conversion into thrift gardens or playgrounds. Public buildings are renovated, and given a new dress inside and



“The snow loader is a wonder” says Duluth

“The snow loader is a wonder, and so far has done all that was claimed for it,” said W. H. Tischer, Duluth Commissioner of Public Works, after a Barber-Greene had been put to the test in Duluth’s big Christmas snow storm.

“With the assistance of other equipment and additional trucks easily obtainable in a crisis, the machine puts the city in an enviable position in case of excessive snow fall and drifting.”

And the Duluth Herald goes on to praise: “It will do the work of 100 men and 20 teams.

“Depth of snow makes little difference in the operation of the machine, which pushes its way steadily into the face of the drift, cutting off with the sharp bottom blade and sides, a mass five feet wide from the ground up, the mass being broken off by its weight and, if necessary, the shovels of the

two operatives standing on a platform at either side.

“The machine loaded the snow, already melting and packing, with astonishing ease, filling the largest trucks in two minutes.”

Loading at the rate of 200 cubic yards an hour, keeping a large fleet of trucks running at maximum speed, the Barber-Greene works tirelessly for days at a time, in the face of the heaviest snows.

Barber-Greene’s are cutting the time and labor costs for snow removal in many of our big cities. And their swift work is preventing or shortening those tie-ups that bring such heavy losses to business.

Send for the book, “Mechanical Snow Handling,” which describes the snow-fighting methods adopted by many cities and street railways. It also describes the Barber-Greene and the new side discharge design.

BARBER-GREENE COMPANY—Representatives in 33 Cities—515 W. Park Avenue, Aurora, Illinois

BARBER  **GREENE**
SNOW LOADERS

out. Stone and brick work is sandblasted. Landscaping is renewed, and parks are cleaned up. Flies and mosquitoes are combated.

"Property values are increased by the improvement of many run-down and unsightly residential streets. Warehouses and factory buildings are cleaned up and painted up to an extent that visibly improves the morale and efficiency of the workers. The campaign advertises the city, attracts new population, starts repairs and building activity, and stimulates business by creating a lively demand upon local business men for everything needed in making homes cleaner, more attractive, and safer from fire, disease and the weather. It stabilizes, restores and increases the value of real estate, and helps both bankers and borrowers.

"Allen W. Clark, who organized the Bureau in 1912 with the cooperation of manufacturers whose voluntary contributions finance the Bureau, is chairman. R. W. Emerson is executive secretary. Any one interested in starting or conducting a community Clean-up and Paint-up campaign is invited to write to the National Clean-up and Paint-up Campaign Bureau, 3713 Washington Avenue, St. Louis, Mo., for free plans and suggestions."

Prize Offered for Play on Social Welfare Problem

A CONTEST for a one-act play, in which an award of \$250 is offered, has been announced by the Committee on Publicity Methods in Social Work, 130 East 22nd Street, New York, N. Y. It is planned to produce the prize-winning play under the auspices of the Committee in connection with the National Conference of Social Work to be held in Toronto during the week of June 24, 1924.

Every play submitted must be an original work and not a dramatized story or a translation, and shall not have been previously produced or published. The play should be written for an adult audience and must deal with some phase of present-day social problems such as are found in the fields of child welfare, immigration or public health. The presentation of the play is limited to forty-five minutes.

The contest is open to any individual or organization subscribing to the Committee on Publicity Methods in Social Work, or to any one not a subscriber who wishes to submit a play through a subscriber known to him. All manuscripts must be in the hands of the Committee by March 15, 1924.

Fifth Election in Ashtabula Under Proportional Representation

THE Chamber of Commerce of Ashtabula, Ohio, gives considerable prominence in its bulletin, *The Ashtabulan*, to the result of the election for members of the new City Council, who took office on January 1, 1924. This is the fifth election by proportional representation in that city. *The Ashtabulan* says in part:

"A total of 5,196 ballots were cast, of which

178 were discovered to be invalid. This means that 3.5 per cent of the voters still do not understand the plan of marking a P. R. ballot—a low percentage.

"The quota was arrived at by dividing the number of valid ballots by eight—one more than the number of seats to fill—and adding one to the quotient, which proved the quota to be 628.

"After viewing the counting of the ballots and the transferring of votes, F. L. Olson of the Bureau of Municipal Research of Milwaukee, Wis., praised the manner in which the election was conducted in Ashtabula. He writes:

"Of the four candidates who are members of the present council, not one was defeated. Voters tend to retain their leaders so long as they do well and are willing to run. Three of the four were elected by quotas and one on the first count.

"The count was made in the city council chamber in full view of many who wished to see and hear. The ballots were handled in the open and the transfers were made where everyone could see. Citizens came and went all afternoon. Visitors were welcome.

"The whole procedure left an impression of a strong desire on the part of the officials to have the people feel that this was their election and they were welcome to see it through."

Adult Education in Psychology and Social Sciences

THE Dallas Institute for Social Education, the successor to the Dallas School of Social Work, is conducting this winter, under the auspices of the Civic Federation of Dallas, a series of lecture courses on the social sciences and allied branches. Seven courses are offered, covering the following subjects:

- Behavior Psychology
- Industrial Problems
- International Relations
- Social Function of the Church
- Social Institutions
- Social Value of the School
- Vocational Guidance

The School of Social Work, which was organized in 1915, has since that time offered each year courses in elementary sociology, psychology, child problems and similar subjects for the purpose of stimulating the social thinking of those interested and of offering training to social workers in the fundamental principles of social service. While the central interest remains the same, the purpose of the lectures has now become one of understanding rather than of expert training.

The aim of the Institute is to supply the need for adult education which has long been felt but only recently recognized. The courses chosen are those for which there has been the greatest voluntary demand, and are subject to change or expansion as the need is felt. In addition to well-qualified local instructors, the teaching staff has been augmented by the securing of many widely known speakers, each to devote a week to lecturing at the Institute. The sessions were begun on November 12, 1923, and will extend to April 3, 1924. A nominal fee of \$5 or \$2.50 is charged for registration, depending on the number of lectures required to complete the course.



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The experience of Edward E. La-Schum, General Superintendent Motor Vehicle Equipment, American Railway Express Company, in the use of Ford Cars and Trucks and Fordson Tractors is an outstanding example of how a business can be "Fordized".

In hundreds of cities, millions of pounds of Express are delivered every day by a fleet of 1200 Ford One-ton Trucks, many of which save their cost every six months over previous haulage equipment.

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Polk Street station, Chicago, one Fordson saves in time and labor at the rate of \$4370 a year.

The use of Ford Coupes and Sedans by officials, and of Ford Touring Cars. Roadsters and Coupes by inspectors and repairmen instead of street cars has doubled the efficiency of these men.

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Edward E. La-Schum is the author of a new book, "The Motor Truck—Applied Mechanics, for Owners and Drivers".

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See Ford Authorized Dealers for further facts about this and other examples of Ford operation.

For Traffic Relief in Boston—New Two-Mile Thoroughfare Proposed

A STREET-OPENING project for traffic relief in Boston, estimated to cost \$32,850,000, is contained in a bill awaiting action at the 1924 session of the General Court of Massachusetts. The proposal, which has the endorsement of Mayor James M. Curley, is based upon a recommendation of the City Planning Board, providing for a new intermediate thoroughfare 100 feet wide, from the intersection of Washington and Kneeland Streets, through Church Green, Fort Hill Square, Mercantile Street, Cross Street, Haymarket Square, Merrimac Street, Wall Street and Leverett Street to Charles Street at the viaduct bridge, together with certain related widenings and extensions.

process of tearing down and reconstruction is an unpleasant one, causing temporary inconvenience, but there is no other way to secure the desired results. It is what London did, after talking about it for more than two generations, when Kingsway and Alwiche were created at a total cost of about \$30,000,000. New York extended Seventh Avenue across the irregular street system of old Greenwich Village, and widened Varick Street from 65 feet to 100 feet at a cost of more than \$8,000,000 in property damage, exclusive of the physical improvement. The people of St. Louis have voted by a large majority to expend more than eighty millions of dollars on municipal improvements, more than eight and a half millions of which is for the opening and widening of streets.

"I firmly believe that the value of the proposed intermediate thoroughfare would be



Courtesy of the Boston City Record

PLAN OF \$32,000,000 NEW STREET PROJECT DEvised BY MAYOR CURLEY AND THE BOSTON PLANNING BOARD FOR RELIEF OF TRAFFIC CONGESTION

It is estimated by the City Planning Board that a very large proportion of the expense of the proposed improvement may be returned through the assessment of betterments. The plan has been discussed with no less than twenty civic, business and professional groups in the city, and it is the consensus of opinion that it is a city-wide rather than a local improvement, and that the entire business district will derive a direct, substantial and assessable benefit therefrom.

The City Planning Board has had the benefit throughout of the advice and assistance of Nelson P. Lewis, of New York, its general consultant, who states in the concluding paragraph of his report dealing with this particular problem:

"The plan for the creation of this new thoroughfare may be somewhat startling. The

worth to Boston far more than it would cost, and that the special benefit to property in the area traversed by it would justify the imposition upon the property of a substantial part of the expense."

A Milestone for Each City

WHY not an official milestone for every city and town in the United States, from which local distances on all highways radiating from your city or town may be accurately measured? In Washington there is an official Zero Milestone from which all distances on highways in the United States are measured. Los Angeles has followed the example of Washington, and an official milestone will be dedicated in the near future.

While two milestones were erected to symbolize the beginning of highways in the National



-Traffic Accidents Prevented- by the Lehman Traffic Guide

Puts an end to all traffic troubles. On duty day and night. Made of tough gray iron, weighs 140 pounds and stands five and one-half inches above the pavement. Fitted with 10 bull's eye lenses so protected as to be unbreakable. The heaviest truck can pass over it without injury. The most efficient and practical traffic regulator yet devised. Initial cost is small. Maintenance cost is practically nothing. Designed to fit any manhole, thus acting as a manhole cover also. Is merely imbedded in concrete. Once installed no further attention is necessary. The most practical guide on the market today. For cities large and small.

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Capital and on the Pacific Coast, they will, however, serve a useful purpose locally. For example, in Washington distances on all of the highways radiating from the Capital as shown on the maps of the American Automobile Association are measured from the Zero Milestone. Real estate agents are beginning to make use of the Zero Milestone in advertising the distance from Washington of suburban or rural property for sale. Signboards along the highways giving the mileage to and from Washington will be corrected to show the mileage from the Zero Milestone, thereby giving the motorist accurate and uniform information as to the distance from a fixed point in Washington.

The official milestone need not be expensive. A simple stone marker placed at some central point in a city or town by direction of the proper authorities will provide a zero point from which distances can be measured. It can, of course, be made just as elaborate as the city or town desires it to be. The official milestone can fittingly commemorate the services of some citizen or group of citizens who have performed some outstanding service for better streets and highways of their community.

With official milestones in every city and town all disputes as to distances between certain cities or towns can be accurately settled, as the understanding will be that the distances between milestones will be taken.

—From *American Motorist*, the official publication of the American Automobile Association.

Campaign for New Charter for Kansas City, Mo.

AT a special election to be held on February 26 the voters of Kansas City, Mo., will choose candidates for a charter commission. With a view to securing the best possible form of government for the city a Citizens' Charter Committee of Forty has recommended that candidates be selected who are pledged to write a charter which shall embody the following principles:

1. A small single-house council, at least part of the members to be elected by districts, whose duties shall be legislative, not administrative
2. The administrative affairs to be directed by a city manager, who shall be chosen by the council
3. The mayor to be elected by vote of the people, to be the presiding officer of the city council, and to perform the usual functions of mayor under the city manager form of government
4. Some form of ballot without party designation, so far as may be possible under existing state law
5. Modern financial and budget provisions
6. Consolidation of city and county tax offices
7. A method of paying for public improvements which will eliminate the evils of the present tax bill system

The chairman of the Citizens' Charter Committee is H. M. Langworthy, with law offices at 501 Lathrop Building

Versatility of the United States Public Health Reports

MUNICIPAL officials and public health officers who are not reading regularly the *Public Health Reports* issued weekly by the U. S. Public Health Service are depriving themselves not only of many valuable statistics and much practical information on public health matters, which even the layman can grasp, but also of enlightenment on a wide variety of subjects on which neither the daily press nor the radio has yet begun to broadcast the results of the latest researches. The following headings are from articles in recent issues:

Epidemiological Study of Folliculosis of the Conjunctiva

Fleas Found on Wild Animals in Bitterroot Valley, Montana

Acidification and Toxicity of B. Botulinus Toxin

Serological Classification of Brucella Melitensis from Various Sources

And the Department of the Interior, not to be outdone, sent to the newspapers last month an item on the *Detonating Values of Hexamethylenetriperoxidamine*.

Lower Automobile Insurance Rates for the Safer Cities

A NEW incentive for cities in the United States to carry on effective safety work has been created by the revised schedule of rates and rules for automobile accident insurance which was put into effect on January 14 by the National Bureau of Casualty and Surety Underwriters. In future, cities maintaining a low percentage of automobile accidents will not only benefit by the saving of life but will also enjoy reduced accident insurance rates. In making the new rates public, Jesse S. Phillips, General Manager of the National Bureau, points out that while heretofore rates were based on the accident experience of groups of cities of similar size, under the new plan the insurance rating of a city will be determined by the actual accident experience of automobiles in that particular city.

Before determining the new schedule of rates, a staff of experts at the headquarters of the National Bureau and in the home offices of the insurance companies, studied the three-year accident experience of more than 700,000 automobiles in 181 cities and territories. As a result of this survey, an average reduction of 6 per cent has been made in the rates for public liability insurance for the country as a whole, and reductions as high as 20 per cent have gone into effect in some cities.

THE SEMI-ANNUAL INDEX for Volume XXIX of THE AMERICAN CITY (July-December, 1923) will be sent to any subscriber on application.

Quality means long life in Federal Motor Trucks. They have been manufactured for fourteen years with the one idea of giving many years of service—at lowest cost per year. The purchase of Federals is protection for your investment.



Now is the season for extra labor by the street gangs. This Federal 3½ ton is helping to keep the streets clear of snow in Jersey City, N. J. The plow is operated from the driver's seat. Write for particulars.

Write for Booklet S.10 "Making One Thing Better."

FEDERAL MOTOR TRUCK COMPANY
Detroit, Michigan

Municipal and Civic Publications

Prices do not include postage unless so stated

The Elements of Public Health Administration.—By George Sparr Luckett, A. B., M. D., Director of Public Health, State of New Mexico, and Harold Farnsworth Gray, B. S., M. S., Gr. P. H., Chief, Division of Sanitary Engineering and Sanitation, New Mexico Bureau of Public Health. P. Blakiston's Son & Co., Philadelphia. 1923. XI + 460 pp. Charts and tables. \$3.00.

This manual of principles, methods and procedure for health officers is based on the wide practical experience of its authors, and aims to show how to get successful results and to win the interest, cooperation and approval of the public. It covers with reasonable brevity and with clearness and definiteness the many divisions of the field of public health administration, and methods of dealing with preventable diseases. The appendix contains plans for county health work and emergency organization for relief in epidemics, instructions for public health nurses, the technique of the Schick test, and other important information. A book for new health officers of small communities, for experienced health officers who are interested in new view-points, and for reference in schools of public health.

The Community Newspaper.—Its Promise and Development.—By Emerson P. Harris, Specialist in Industrial Journalism, and Florence Harris Hooke, Research Student in Psychology. D. Appleton and Company, New York. 1923. XIV + 377 pp. \$2.50.

A study of the part which a local newspaper may take in meeting the community needs for information, intercommunication, and coordination of town activities. In Part I the community and the individual are analyzed with special reference to their newspaper needs. Part II shows how the editorial contents of a newspaper can meet these needs. Part III deals with building up circulation and advertising. Part IV studies the publisher's relation to his field: selecting the field, policy and management, the paper's problems and opportunities, and building and valuing a publishing property. This is not only a thoroughly practical handbook on local journalism, based on long and valuable experience, but an analysis of community life through an understanding of individual life problems, and is therefore of interest to many others besides those for whom it is specifically written.

The Financing of Education in the State of New York.—By George D. Strayer and Robert Murray Haig. The Macmillan Company, New York, 1923. XIII + 205 pp. Charts and tables. \$1.00.

A report reviewed and presented by the Educational Finance Inquiry Commission under the auspices of the American Council on Education, Washington, D. C. It contains valuable material for school executives, boards of education, taxpayers and legislators, being the first complete formulation of principles involved in the financing of education and the first fully interpreted statement of facts on the cost and support of education in any state. Several other volumes of the Inquiry are soon to be published. This volume offers to citizens of other states important material in actual figures for comparison and in methods of calculation. The chapter on "The Economic Limitations of Educational Expenditures" is particularly valuable.

The Control of the Social Mind.—By Arland D. Weeks, Dean of the School of Education of the North Dakota Agricultural College. D. Appleton and Company, New York. 1923. XVIII + 263 pp. \$2.25.

For all who hold or aspire to fill positions of civic leadership, modern psychological thought has much that is useful and stimulating. Of special importance, obviously, are the workings and control of the more public phases of mental behavior. In this authoritative new book Dean Weeks discusses many subjects of practical importance to all interested in community leadership. The author's readable style is apparent from the paragraphs quoted from his chapter on The Psychology of Public Business, on page 142 of this issue.

Housing Progress in Western Europe.—By Edith Elmer Wood, M. A., Ph. D., author of "The Housing of the Unskilled Wage-Earner." E. P. Dutton & Company, New York. 1923. VIII + 209 pp. Illustrated. \$2.50.

This volume destroys our self-complacency as to superiority of housing conditions in this country in comparison with those in Europe. "We are still discussing points which they settled forty years ago." Mrs. Wood presents this new view-point with vigor, and then proceeds to justify it by the fruits of her personal study and investigation in Great Britain, Belgium, France, Italy and Holland. The book is vivid, fresh, interesting, instructive and authoritative. The progress attained by private initiative and state action is followed through its various steps, and actual undertakings are described in detail and illustrated. Notes regarding housing legislation and practise in Spain, Portugal and Switzerland are given in an appendix, and a bibliography is included.

Town Planning and Town Development.—By S. D. Adshad, M. A., F. R. I. B. A., Professor of Town Planning, London University. E. P. Dutton and Company, New York. 1924. XVI + 204 pp. 16 plates and 18 diagrams in the text. \$5.00.

A study of the social and administrative conditions that influence town planning at the present time; a practical book for students of the science and art of town planning. It recognizes that intercommunication is the greatest factor in the progress of civilization, and that how to utilize this development to the best advantage is one of the most important questions in the study of town planning. Therefore, the chapters that deal with town extension, transport, traffic, and road administration are of special interest. Others, on zoning, town planning by private initiative, housing, the Town Planning Acts, and the progress of town planning on the Continent and in America, also present much valuable material. The book can be not only studied with profit, but read with enjoyment.

Citizenship.—By W. H. Hadow, Vice-Chancellor of Sheffield University, England. Oxford University Press, American Branch, New York. 1923. X + 240 pp. \$2.00.

This volume is a collection of lectures delivered on the Stevenson Foundation in the University and city of Glasgow in 1922. The chapter heads are: The Statement of the Problem; Other Ideals of Conduct; Liberty, Equality, and Fraternity; The State as Means; The State as End; The State as Personality; Citizenship and Empire; Internationalism and Cosmopolitanism; Education in Citizenship; De Civitate Deia.

The Community Playhouse.—By C. J. DeGoviea. B. W. Huebner, Inc., New York. 1923. 165 pp. Illustrated. \$2.00.

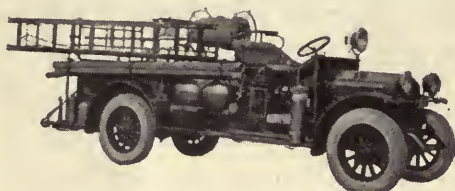
A manual on the organization and maintenance of the theater for neighborhoods and small towns, dealing simply and definitely with the essential details. The chapter heads indicate the points discussed: The Players' Group; The Audience; The Building; The Stage; Scenery; Making of Scenery; Designing of Scenery; The Lighting; Production; Acting; Grouping; Color; Costumes. A number of the chapters are accompanied by bibliographies for wider reading.

Architectural Designs for a Small Hospital.—Published by the Modern Hospital Publishing Co., Inc., Chicago. 1923. 104 quarto pp. Drawings, views, charts. \$1.00 postpaid.

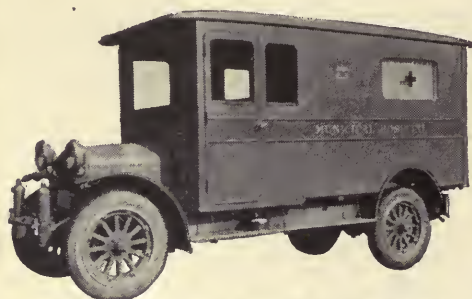
A selection from the designs submitted in a contest conducted by "The Modern Hospital" for plans of a thirty- to forty-bed hospital, including designs receiving prizes and honorable mention; with critical comments on the plans and with special reports on the organization and equipment of the first-prize hospital. A reprint from "The Modern Hospital," issues of May, June, July, August, and September, 1923. The first prize was won by Butler & Rodman, of New York City.



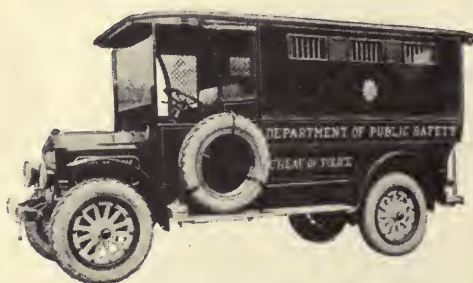
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DEPENDABLE TRANSPORTATION

City Growth and Values.—By Stanley McMichael, realtor, Robert F. Bingham, attorney at law. The Stanley McMichael Publishing Organization, Cleveland, Ohio. 1923. 369 pp. Illustrated. \$4.00 postpaid.

Published with the approval of the National Association of Real Estate Boards. Showing why and how cities develop and land values are created and affected. This involves the study of local transportation, street widths, the trend of pedestrian traffic, and a great variety of other conditions affecting trade and rentals. In the Addenda are tables showing population density and percentage of home owners in American cities, the results of a questionnaire on highest land values of different kinds of property in about thirty of the larger cities, a bibliography of important books on real estate, etc.

Editing the Day's News.—By George C. Bastian, Copyreader on the Chicago Daily Tribune; Lecturer in News Editing in the Medill School of Journalism of Northwestern University. With a Foreword by H. F. Harrington, Director of the Medill School of Journalism. The Macmillan Company, New York. 1923. XI + 252 pp. Illustrated. \$2.75.

A text-book for the newspaper technician, covering the organization of a newspaper office, an analysis of "news," and the way it is handled in all its stages to the reader. The background of a newspaper office is created for the student of journalism and the various processes of the work, with the exception of news-getting, are clearly and definitely explained, from the most elementary to the technical. Visualization of methods is an important characteristic of the instruction given in this book, and all the material is made thoroughly interesting.

Virginia Municipal Review.—Official publication of the League of Virginia Municipalities, Vol. 1, No. 1, January, 1924. 28 pp. Illustrated. 15 cents a copy. Morton L. Wallerstein, Secretary of the League, is the editor. Besides editorial news notes, and announcements in regard to the annual meeting of the League, this number contains the following articles: "Construction of Public Improvements with Municipal Forces," by Edward A. Beck, City Manager of Lynchburg; "The Laboratory in Public Health Work," by Aubrey H. Straus, Director of Laboratories, Virginia State Board of Health; "The School Tax Situation," by Harris Hart, Superintendent of Public Instruction, Richmond; "Street Signs—A Civic Improvement," by A. Spring, President, Municipal Street Sign Company, Inc., New York City. (Apply to the Secretary of the League, Travelers Building, Richmond, Va.)

The Museum News.—Vol. 1, No. 1, January 1, 1924. 4 quarto pp. Published twice a month by the American Association of Museums. Lawrence Vail Coleman is the Editor. Devoted to needs and news of museums and museum workers. (Apply to the Association, at the Smithsonian Institution, Washington, D. C.)

Health News.—Vol. 1, No. 8, January 7, 1924. Published every Monday by the New York State Department of Health, Matthias Nicoll, Jr., M. D., Commissioner. 4 quarto pp. Information on current events in public health, furnished for the benefit of officials, organizations and individuals interested in this field. (Apply to the Department, Albany, N. Y.)

Smoke Abatement.—By Osborn Monnett. Technical Paper 273 of the United States Bureau of Mines. 1923. IV + 31 pp. Illustrated. One of a number of publications by the Bureau of Mines on this subject. The author says: "The broad assertion can be confidently made that any operation requiring fuel can be conducted without objectionable smoke, and yet use bituminous coal in some form." 15 cents. (Apply to the Superintendent of Documents, Government Printing Office, Washington, D. C.)

Children of Preschool Age in Gary, Ind.—Publication No. 122 of the Children's Bureau, Washington, D. C. Part I, General Conditions Affecting Child Welfare, by Elizabeth Hughes; Part II, Diet of the Children, by Lydia Roberts. 175 pp. Views, diagrams, tables. Showing the conditions surrounding the children born during the five years 1911 to 1915 who were living in Gary in March, 1918, and the habits of life which they were forming. 20 cents. (Apply to the Government Printing Office, Washington, D. C.)

The American Public Library.—By Arthur E. Bostwick, Ph. D., Librarian, St. Louis Public Library. D. Appleton and Company, New York. 1923. Third edition, revised and enlarged. XII + 415 pp. Illustrated. \$3.00.

The chapters on county libraries, library publicity, and music in libraries are new in this edition, which contains much other new material. The book is considered as up-to-date as it is possible to make it. It covers not only the machinery and methods of library training, but makes clear the many ways in which libraries may be of service to the people. It is of interest to the general reader as well as to the library student, and is written in a readable style, from the human viewpoint.

How to Secure a County Library.—Including the text of the County Library Law of Texas. Bulletin 1 of the Texas State Library. January, 1924. 45 pp. 1 view, 1 map. This pamphlet tells how to organize a county library in Texas, gives brief descriptions of the county libraries already established in the state, answers questions, gives pointers, petition and contract forms for library service, and tells many interesting facts regarding the value of this work. (Apply to the Texas State Library, Austin, Texas.)

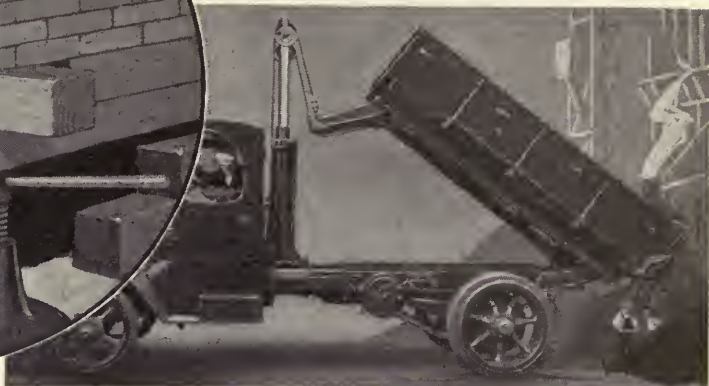
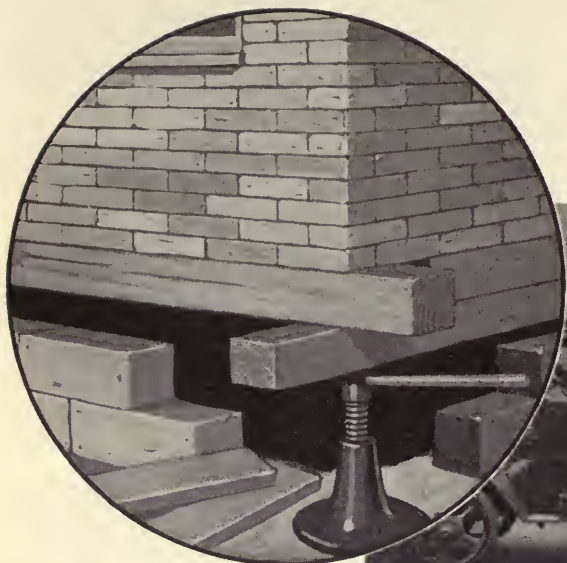
Roadside Planting and the Care of Trees and Shrubs Along Highways.—Reprinted in revised form and with new material from Concrete Highway Magazine, for August, September, and October, 1923, by the Portland Cement Association. 12 pp. Illustrated. The original articles were prepared by Robert Kingery, Assistant Manager, Highways Bureau, Portland Cement Association; formerly with O. C. Simonds & Company, landscape gardeners, Chicago. Containing instruction and illustrations on these divisions of the subject: location and spacing of roadside trees; setback of planting from intersections, curves and railroad crossings; rights of way for telephone and telegraph poles and wires; staking; planting; and care after planting. A list of trees and shrubs for highway planting is given, with both common and scientific names, and the regions where they will grow. (Apply to Portland Cement Association, 111 West Washington Street, Chicago, Ill.)

News-Bulletin of the Harmon Foundation.—Volume I, Number 1, December, 1923. Published by the Harmon Foundation, 140 Nassau Street, New York, N. Y., which is primarily interested in assisting in the application of business methods that will promote efficiency in the branches of educational and philanthropic work. Considerable space is given in this number to the Foundation's Division of Student Loans, its methods of giving aid, and the survey which it is making of student loan methods. The work of the Division of Playgrounds, which helps small, growing towns of less than 15,000 population to get recreational areas, is also described. 8 quarto pp. (Apply to the publishers.)

Highway Traffic.—Report on Highway Traffic to the Senate Committee of the District of Columbia, by Wm. P. Eno. Prepared December 7, 1923. 7 pp. Published by the Eno Foundation for Highway Traffic Regulation. A frank statement of conditions and suggested remedies. Apply to the Foundation, Washington, D. C.)

Chicago Health Department.—Report of the Department for the year 1922. Published November, 1923. XIV + 448 pp. Views, drawings, charts, tables. A most interesting collection of reports from the Commissioner's office and the Bureaus of Publicity and Education, Medical Inspection, Water Safety and Typhoid Control, Laboratories, Sanitation, Food Inspection, and Vital Statistics. The death-rate in Chicago for 1922 was 11.18 per 1,000 inhabitants, the lowest in the history of the city, except in 1921, when it was 11.08. (Apply to Herman N. Bundesen, M. D., Commissioner of Health.)

Anti-Tuberculosis Gains.—The Causes for the Recent Decline in Tuberculosis and the Outlook for the Future. An address delivered before the Nineteenth Annual Meeting of the National Tuberculosis Association, at Santa Barbara, Calif., June 20, 1923, by Louis I. Dublin, Ph. D., Statistician, Metropolitan Life Insurance Company, New York. 31 pp. Charts, tables. Presenting two opposing views, held by the "environmentalists" and the "constitutionalists." (Apply to the Metropolitan Life Insurance Company, 1 Madison Avenue, New York, N. Y.)



The Powerful Lift of the Screw-Jack!

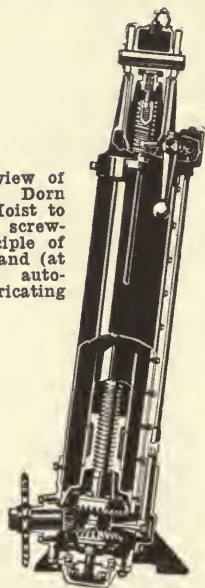
THE screw-jack principle is one of the most powerful lifts known to engineering. Huge buildings weighing thousands of tons have been raised by jack-screws.

It is the screw-jack principle which is used in the Van Dorn *Mechanical Truck Hoist*. The heaviest load can be dumped in 20 seconds at moderate speed of the motor. The hoist is always positive in control—no weather troubles—it operates as surely and speedily in mid-winter as in mid-summer. It is self-lubricating, requires scarcely any attention, and stands up under long hard usage.

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Send for complete catalog describing Van Dorn Mechanical Hoists, Vertical and Horizontal type, and Dump Bodies for all purposes.

Cutaway view of the Van Dorn Vertical Hoist to show the screw-jack principle of operation and (at top) the automatic lubricating device.



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National Association of Commercial Organization Secretaries.—Proceedings of the Ninth Annual Meeting, held in Cincinnati, Ohio, October 29-31, 1923. Full report of addresses and discussion, with complete membership list of the Association and the convention registration summary by states. (Apply to Raymond B. Gibbs, Secretary-Treasurer, N. A. C. O. S., Manager Chamber of Commerce, Kansas City, Kans.)

Fire Prevention and Public Safety Ordinances, Chicago.—Ordinances, from the Chicago Municipal Code of 1922, pertaining to the work of the Bureau of Fire Prevention and Public Safety of the Fire Department of Chicago. 139 pp. 35 cents, plus postage. (Apply to the Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

The Finger Lakes of Central New York.—Published by the United States Survey Company, Inc., Rochester, N. Y. A large, conveniently folded, detailed guide map, with descriptive notes, showing all improved highways and points of interest. (Apply to the publishers.)

Public Health Nursing.—32 mimeographed pp. of bibliography on the various phases of this subject, in periodicals, books and pamphlets, January 1, 1915—April 1, 1923. (Apply to the Hospital Library & Service Bureau, 22 East Ontario Street, Chicago, Ill.)

Americanization in Philadelphia.—A City-wide Plan of Coordinated Agencies under Direction of The Americanization Committee, Philadelphia Chamber of Commerce. A manual for Americanization workers. 96 pp. Illustrated. Including type programs organized within the field of leading community agencies, existing laws bearing upon the work, and a variety of other pertinent information. (Apply to Edwin E. Bach, Director, Americanization Bureau, Philadelphia Chamber of Commerce, Philadelphia, Pa.)

Applied Sanitary Science.—By Robert Keeley, Mem. Royal San. Inst., County Sanitary Officer, Lancashire County Council. With an Introduction by J. J. Butterworth, M. D., D. P. H., County Medical Officer of Health, Lancashire County Council; Lecturer on Public Health, University of Manchester. Published by The Sanitary Publishing Co., Ltd., 8 Brema Building, Chancery Lane, London, E. C. 4, England. Model answers and groundwork for the examinations of The Royal Sanitary Institute, The Incorporated Sanitary Association of Scotland, The Diploma of Public Health, and other examining bodies. 204 pp. (Apply to the publishers.)

The Constitutionality of Proportional Representation.—By William Anderson, University of Minnesota. Supplement to the National Municipal Review, December, 1923. 20 pp. Discussing the decisions which have passed upon the four newer forms of voting—limited, cumulative, preferential, and the Hare System, and analyzing the state constitutional provisions on the right of electors to vote. "The fundamental principle to be kept in mind is that of equality of right among voters." (Apply to the National Municipal League, 261 Broadway, New York, N. Y.)

Americanization in Delaware.—Report of the Americanization Bureau for 1922-1923. Published by the Service Citizens of Delaware. Prepared by Grace E. Hartshorn, Director of the Americanization Bureau. 45 pp. Illustrated. Dealing with the manner in which the Service Citizens supplements in Americanization work the efforts of the state, the courts, and other constituted authorities. (Apply to the Service Citizens of Delaware, Wilmington, Del.)

City Taxes in Philadelphia.—A Study of City Tax Delinquency in Philadelphia and Suggested Improvements of the City Tax System. Prepared by the Committee on Periodic Payments of City Taxes; Karl Scholz, Chairman. Published by the City Club of Philadelphia, 313 South Broad Street, Philadelphia, Pa. 1923. 40 pp. Chart, tables, drawing. Supplement to the City Club News, November 24, 1923. (Apply to the publishers.)

City Planning.—Mimeographed copy of address by C. E. Smith, consulting engineer, St. Louis, Mo., delivered to the meeting of the Iowa Section of the American Society of Civil Engineers, at Cedar Rapids, Iowa, September 14, 1923. Free. (Apply to the author, Railway Exchange Building, St. Louis, Mo.)

Intelligence Tests in the Civil Service.—By L. L. Thurstone. A discussion of fundamental principles in the development and application of intelligence tests. One of the Public Personnel Studies published by the Bureau of Public Personnel Administration, 26 Jackson Place, Washington, D. C. 24 mimeographed pp. \$3.00 per year; 25 cents per number. (Apply to the Bureau.)

A Model State Constitution.—Prepared by the Committee on State Government of the National Municipal League. 43 pp. Reprinted with explanatory articles, as follows: The Legislature, by H. W. Dodds; The Executive, by John A. Fairlie; The Budget, by A. E. Buck; The Judiciary, by W. F. Dodd; Counties, by Richard S. Childs. (Apply to the National Municipal League, 261 Broadway, New York, N. Y.)

Baltimore, Md.—Report of the Baltimore Tax Commission, 1923. (Apply to Horace E. Flack, Secretary of the Commission.)

Chicago, Ill.—Municipal Code of the South Park Commissioners, adopted March, 1923. (Apply to J. F. Neil, Secretary, South Park Commissioners, Chicago, Ill.)

Hartford, Conn.—Sixteenth Annual Report of the Department of Engineering, for year ending March 31, 1923. (Apply to Roscoe N. Clark, City Engineer.)

Pasadena, Calif.—Tenth Annual Report of the Water Department, for 1922-1923. (Apply to C. W. Koerner, City Manager.)

Petersburg, Va.—For the period September 15, 1920, to June 30, 1923, under the council-manager plan. (Apply to Louis Brownlow, City Manager.)

Salem, Va.—Annual Report for year ending September 1, 1923. (Apply to J. P. Broome, Town Manager.)

On the Calendar of Conventions

FEBRUARY 13-15.—ATLANTIC CITY, N. J.

New Jersey Mosquito Extermination Association. Annual meeting. Secretary, Thomas J. Headlee, New Brunswick, N. J.

FEBRUARY 13-15.—TRENTON, N. J.

New Jersey State Highway Association. Annual convention. Secretary, Kenneth D. Rice, Trenton, N. J.

FEBRUARY 14.—BOSTON, MASS.

Massachusetts Highway Association. Annual meeting. Secretary, John M. McCarthy, Natick, Mass.

FEBRUARY 20.—PHILADELPHIA, PA.

Conference on Administration of City Paving Departments. To be held at the Engineers' Club of Philadelphia, 1317 Spruce Street. Address Charles E. Billin, Secretary of the Club.

FEBRUARY 24-28.—CHICAGO, ILL.

National Education Association. Department of Superintendence. Annual meeting. Secretary, Dr. S. D. Shankland, President, Andrews Institute for Girls, Willoughby, Ohio.

FEBRUARY 27-29.—TORONTO, ONT.

Ontario Good Roads Association. Annual convention. Secretary, S. L. Squire, 98 Albany Avenue, Toronto, Ont.

MARCH 6-7.—FRENCH LICK SPRINGS, IND.

Indiana Sanitary and Water Supply Association. Annual meeting. Secretary, C. K. Calvert, 1902 North New Jersey Street, Indianapolis, Ind.

MARCH 27.—PUEBLO, COLO.

Colorado Municipal League. Annual convention. Secretary, Don C. Sowers, Boulder, Colo.

APRIL 3-5.—MINERAL WELLS, TEX.

Texas Commercial Executives Association. Annual convention-school. Secretary, J. E. T. Peters, Ranger, Tex.

APRIL 7-10.—LOS ANGELES, CALIF.

National Conference on City Planning. Annual conference. Secretary, Flavel Shurtleff, 130 E. 22nd Street, New York, N. Y.

APRIL 23-26.—KANSAS CITY, MO.

American Physical Education Association. Annual convention. Secretary, Dr. J. H. McCurdy, Box G, Highland Station, Springfield, Mass.

MAY 6-8.—CLEVELAND, OHIO.

Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, Mills Building, Washington, D. C.

MAY 19-24.—NEW YORK, N. Y.

American Water Works Association. Annual convention. Address W. M. Niesley, 153 West 71st Street, New York, N. Y.

MAY 19-24.—BOSTON, MASS.

National Association of Purchasing Agents. Ninth Annual International Convention and Informashow. Secretary, W. L. Chandler, 19 Park Place, New York, N. Y.



Compact arrangement of cutting units makes control easy.

Two views showing how units are pushed — not pulled, the lifting arrangement and absence of weight on cutting units.

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locked adjustments—all are found in the units themselves.

No weight rests on the units when assembled. The turning radius is very short. The cutting units can be easily raised. They are pushed individually as they should be—not pulled.

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News and Illustrations

Items of Interest to City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

A New Portable Air Compressor

The WK-311 Sullivan portable gasoline engine air compressor, which is a new outfit being placed on the market by the Sullivan Machinery Company, 122 South Michigan Avenue, Chicago, Ill., is mounted on an all-steel truck with a pole attachment for haulage by a pair or horses. If desired, the truck can be equipped with rubber-tired wheels and internal expanding band brakes. The compressor at a speed of 450 r.p.m. has a displacement of 168 cubic feet per minute. The actual horse-power required for the operation of the compressor at this speed against 100 pounds pressure is 31. The engine has ample reserve power to drive the compressor at its full rated load. This compressor has ample capacity and power to operate two Rotator hammer drills or paving breakers or several compressed-air spaders to their full capacity at 100 pounds pressure.

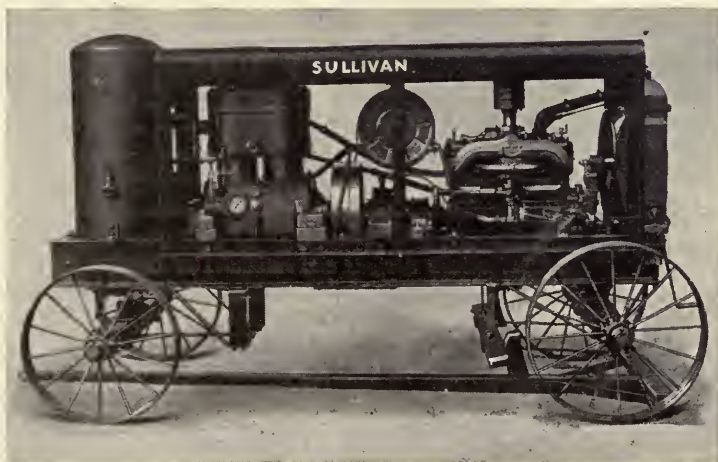
The compressor is of the two-cylinder, single-acting, single-stage type, with cylinders 8 inches in diameter with a $6\frac{1}{2}$ -inch stroke. It is provided with a steel crank-shaft and steel connecting rods with removable boxes lined with white bearing metal of a high grade. Lubrication is provided by a force feed oil pump enclosed in the crank-case and arranged to deliver oil under 15 to 20 pounds pressure to all bearings. The use of this method of lubrication instead of the more common splash oiling system enables the quantity of oil carried into the cylinders to be limited to a small

amount adequate for proper lubrication of these parts, but not sufficient to cause an accumulation of oil in the upper end of the cylinder with a resulting waste and deposit of oil or carbon upon the valves. The small amount of oil thrown off from the crank-pins is prevented from entering the cylinder by suitably arranged baffle-plates.

The air valves are of the improved Sullivan "wafer" plate type, which give low clearance losses, are quiet in action and relatively free from wear and breakage. The valves are located in the cylinder head and are held in place by flat circular leaf springs. Both valves and springs are made of the finest spring-tempered steel obtainable.

The power of the engine is delivered to the compressor through a reduction gearing consisting of a high-carbon, double-treated pinion and gear. These are mounted on high-carbon, double-treated shafts supported in heavy-duty Timken bearings. The gears and bearings will be enclosed in an oil-tight housing of heavy construction supported upon the truck frame. Engine oil, the same as used for the engine and compressor, is suitable. The pinion and gear shafts are connected to the engine and compressor respectively by flexible couplings which compensate for any possible slight inaccuracy of alignment.

The truck body is made of 10-inch channel iron strongly braced, and the axles are made of double 5-inch channel iron. The front wheels



A COMPRESSOR OPERATED EASILY BY A 31-MORSE-POWER, 2-CYLINDER GASOLINE ENGINE

Safeguard the City's Buildings, the Grounds and the Children with a Stewart Chainlink Protection Fence.



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For forty years we have been leaders in the manufacture of iron fence; hundreds of city and municipal cemeteries are among our thousands of installations. Stewart's Iron Fence and Gates are equally popular for town houses, suburban homes, country estates, and other properties where the highest type of enclosure or entrance gateway is required.

**SAVE MONEY FOR THE CITY BY GETTING
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Let us know your requirements in either Iron or Chainlink Wire Fence and we will submit designs and estimates of cost

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are 32 inches in diameter and the rear wheels 36 inches in diameter with cast iron hubs, oval steel spokes and steel rims of 5-inch face. The track gage is 4 feet 8 inches.

Steel side plates are provided, which are locked in place when the outfit is moving or out of service, in order to prevent damage from weather or from tampering.

Outdoor Athletics at Night

For a number of years tennis has been played out of doors by artificial light, but only recently has it been possible to indulge in the night playing of sports which cover larger areas. Last summer at the General Electric athletic field at Lynn, Mass., it was shown that baseball could be played successfully by artificial illumination. Several games were played, one

light with a clear glass 1,000-watt, 110-volt Mazda lamp.

The floodlights were directed down on the field covering the area around the goal post and the field in the immediate vicinity of the goal post. The 18-inch search-light was projected in the air at an angle of about 35 degrees and was used for lighting the sky over the field to take care of aerial plays.

On the right of the field there were six floodlighting projectors, equipped with clear glass, at each station. These were projected on the field to take care of the central area of the field and along the side lines. One 18-inch search-light at each station projected about 35 degrees to take care of aerial plays.

Back of the goal post at the other end of the field at each of the stations, there were seven



PICTURES OF THE FIRST FOOTBALL GAME PLAYED ENTIRELY BY ARTIFICIAL LIGHT

Upper picture shows General Electric team on its athletic field in West Lynn, Mass., the photograph being taken solely by the illumination provided around the field; lower pictures, views of the field and spectators, showing ample illumination without glare

of them being a no-error game, and all were replete with flies and fouls which were easily followed.

This fall the same field was used with similar equipment for football. Eight lighting stations were erected around the field as follows: two 35 feet back of the goal line and 94 feet apart at each end of the field; two 100 feet back of the side lines on the left of the field, 150 feet apart; and two more back of the side lines on the right of the field, similarly arranged. Eight 50-foot poles were used, set about 6 feet in the ground. Two feet from the top, double cross-arms were installed and a railed platform for mounting the unit was constructed on them. Back of the goal line on one end of each station there were six floodlighting projectors, equipped with stippled glass 1,000-watt, 110-volt Mazda lamps and one 18-inch search-

floodlighting units equipped with stippled glass. These projected on the field and lighted around the goal post and the immediate vicinity of the goal posts. One 18-inch search-light at each station was projected into the air at an angle of about 35 degrees.

On the left of the field, at each station, six floodlighting projectors were equipped with clear glass. These units were projected on the field and lighted its central portion or, in other words, overlapped the beams that projected from either end of the field. The light was spread over the field in a fairly uniform manner. One 18-inch search-light at each station projected into the air, thus forming a canopy over the field, to take care of aerial plays on all parts of the gridiron. All eight of the 18-inch search-lights were projected toward the center of the field. The result was that there

THE AMERICAN CITY

A reproduction from an oil painting of King ornamental lighting standard in Augusta, Georgia.

Beauty—technically correct lighting—permanence—all are comprised in each of the King ornamental lighting standards installed for the City of Augusta, Georgia; which are equipped with General Electric Novalux lighting units.



ING MANUFACTURING CO.
ORNAMENTAL LIGHTING STANDARDS

230 South Clark St. Chicago USA

was very little glare, as the units were placed at such angles that at no time were any powerful beams directly in the eyes of the players.

The total candle-power of the lamps used was approximately 5,000,000. During one football game, 58 kilowatts of current were consumed, and the operating cost is estimated at between \$4 and \$5 per hour.

The coaches of the two teams and visiting coaches, as well as the referees, were very favorably impressed with the lighting arrangements, and agreed that this is a distinct advance in athletic field equipment in practising baseball and football as well as hockey at night. Those who are engaged in business during the day may thus be able to make use of municipal athletic fields in the evening.

A Portable Screening, Crushing and Loading Plant

A complete portable plant which produces a good grade of material for road graveling and by which all oversize from the pit run is crushed, thereby adding to the aggregate the sharp, irregular material necessary for a firm, well-bound road surface, has been brought out by the Russell Grader Manufacturing Company, Minneapolis, Minn. Road builders recognize the value of using a certain portion of crushed material in road surfacing as compared with pit-run gravel. The only drawback has been the expense of producing such material. It is claimed that the new Russell plant brings down the cost and provides increased capacity. All units are combined in a compact portable form which can be quickly moved from one place to another. Only one power-plant is required.

This machine takes material from the pit plant, crushes all oversize material, screens everything, and loads trucks, or with an extended conveyor supported by horses may be used to load bins. The hopper immediately below the screen holds enough material to fill a truck promptly without waiting.

The capacity of the plant depends entirely upon the quantity of oversize material passing a specified perforation into the crusher. It is said, however, that 300 to 600 yards a day can be delivered each working day. The operation of the plant is quite simple. The pit-run of

material is brought to the feed conveyor with a dragline, buck scrapers or drag scrapers, and the material is conveyed to a shaking grizzly or screen which passes all smaller material directly into the hopper below. The oversize passes over the perforated screen and into the crusher. The material passing through the crusher is carried back in a bucket conveyor and again deposited upon the grizzly. Should any of the crushed material still be too large to pass the round-hole perforations in the screen, such oversize parts must again pass through the crusher. All material produced by this plant must pass through the screen. This makes the material uniform and certain to pass the specifications of the highway department. The delivery conveyor is a 24-inch belt, which loads the truck directly from the screen or from the auxiliary hopper.

These plants are also built for steam shovel work, in which case the feed conveyor is eliminated and a special receiving hopper is substituted.

The weight of this machine complete is 28,500 pounds and it is operated by a 45- to 50-horsepower engine. The crusher, which measures 8 x 36 inches, is built entirely of steel, with manganese steel jaws, and a positive reduction to 3/4-inch size in one operation. The hopper has a capacity of 3 yards. The feed conveyor has an all-steel carrier frame with a 24-inch belt and spool-shaped rollers. The standard length is 40 feet, but it may be extended by adding 10-foot sections and center supports.

The grizzly, which measures 30 x 120 inches, is used to separate the oversize from the smaller material and is perforated as specified. The delivery conveyor is an all-steel adjustable conveyor having a 24-inch belt and is 20 feet long. The frame is of all-steel construction, and is mounted on trucks with wheels having 12-inch tires and a 3 1/4-inch axle.

Chicago Office Moved

In the January, 1924, issue of *The Water Tower*, the interesting quarterly publication of the Chicago Bridge and Iron Works, Chicago, Ill., and the Horton Steel Works, Ltd., of Canada, the removal of the Chicago downtown offices to the Old Colony Bldg. is announced.



A PORTABLE CRUSHING AND SCREENING UNIT AT WORK IN A GRAVEL BANK

THE AMERICAN CITY

HOLLOWSPUN

LIGHTING STANDARDS



Lighting system installed at Rockaway Beach, New York, last summer.

P LEASING appearance by day and night was, of course, the first essential in the lighting standards for the board-walk at this popular resort. But the proximity of the ocean imposed another very important requisite, viz., the ability to withstand the corrosive action of salt-laden air.

Hollowspun reinforced concrete standards, pictured above, satisfactorily met these and every other requirement.

MASSEY CONCRETE PRODUCTS CORPORATION
Peoples Gas Building Chicago



COMBINATION TRAFFIC AND FIRE SIGNAL INDICATING
"STOP"

A Combination Traffic and Fire Signal

There has been quite a general demand for a signal suitable to be placed at street intersections to warn traffic of the approach of fire apparatus. The majority of accidents resulting in loss of life or damage to apparatus occur at the first two or three street intersections turned or crossed, as the apparatus cannot be relied upon to give timely warning. Moreover, it may go in three directions, up or down the street or straight across; if the traffic officer or the traffic is first unmistakably warned and then advised which way to clear, accidents, generally costly, may be greatly minimized.

The Thomas-Smith street fire signal made by the Thomas-Smith Company, Canton, Ohio, is controlled at the engine-house or by the fire telegraph operator, by first pressing a button which starts the bell on the signal, and, second, by pressing another button which indicates the direction to be taken. The bell is 18 or 20 inches in diameter, and is totally different in tone from street car gongs and automobile horns and can be heard distinctly above any street noise.

A light or a number of lights are suspended from the bottom of the signal, and direction is indicated by the light swinging in the direction the apparatus will take or by all the lights being illuminated and one being swung in the direction to be indicated. In the latter case a moving light is seen with reference to a fixed light.

The combination signal may be also used for controlling traffic. When two arms are extended as illustrated, three lights are shown, indicating "Stop." At the same time traffic in

the other direction will observe two lights, one above the other, indicating "Go." During the time the signals are changing the bell rings. Control may be located in the center of the street, on the sidewalk, or at a central control station. Should a fire occur, the fire department takes electrical control of the signal, the bell rings continuously, and the signal indicates the direction the apparatus will take.

Graphics Headquarters in New York

The Educational Exhibition Company, 26 Custom House Street, Providence, R. I., has opened a New York store and display room at 112 Arcade, 200 Fifth Avenue, near the 23rd Street stations of all subways, the elevated, and Hudson Tubes. Roy K. Patterson will be in charge. An adequate stock of Edexco supplies will be maintained ready for delivery, and information may be secured regarding graphic models, stereopticon slides and electrical displays, in addition to the well-known line of material for the graphical presentation of municipal, industrial and social statistics.

A Continuous Battery Charger

The Magnar battery charger, a device marketed by the General Electric Company, Schenectady, N. Y., for the "trickle" or "floating" charging of railway signal batteries, is being applied to new fields, such as time-clocks, bell systems, burglar alarms and tripping batteries in power-plants and substations. It has been found that on such installation the batteries may be discharged continuously at very low rates or intermittently at higher rate, the average discharge rate being low in either case. By the trickle or floating charge method, the charging equipment operates continuously, the average rate at which the battery discharges being first determined. The equipment is then regulated to supply the battery with just enough current to compensate for the discharge, and a small additional amount to allow for internal leakage. Among the advantages claimed for this method of charging are the continuous maintenance of a fully charged battery, a constant voltage, longer life, and a minimum amount of attention required for care.

Loading Snow on Trucks

The loading of the accumulation of snow on city streets onto motor trucks is one of the chief problems of street-cleaning departments in winter. Just how Barber-Greene snow loaders have solved this problem in many cities is told in "Mechanical Snow Handling," issued by the Barber-Greene Company, 515 West Park Avenue, Aurora, Ill.

CONCRETE LIGHTING STANDARDS

For

**BEAUTY
PERMANENCE
LOW MAINTENANCE**

**When Manufactured
By Our Process**

**WE HAVE DATA ON FILE
FOR THOSE INTERESTED**

**CHICAGO CONCRETE
POST CO.**

PAUL K. FLEMING, *President*

**Lawrence, Lamont and Leland Aves.
CHICAGO, U. S. A.**



Chicago City Beautiful

**Manufacturers of Solid Cast Lighting
Standards, Drinking Fountains, and
Special Concrete Products.**

A Highway Lighting Refractor

Highway lighting requires accurate control of the light of the lamp, since the light must be directed onto the roadway, not into the sky nor the fields, and the lamps must be mounted high to avoid glare and must be placed far apart for economy of installation costs. The Holophane Glass Company, 342 Madison Avenue, New York City, has developed a highway refractor which redirects the light of the lamp and distributes it along the roadway. This refractor is 8½ inches in diameter. The outer surface of the refractor is perfectly smooth and nearly vertical, minimizing the collection of dust. When this refractor is mounted in the dust-tight fixture the lamp is totally enclosed and both the lamp and the inside of the fixture are protected from dust.

Each refractor comprises two pieces. The inside piece carries horizontal refracting prisms on its outer surface which turn the upward light rays from the lamp downward and the



A NEW REFRACTOR FOR HIGHWAY LIGHTING

downward light rays upward to obtain a better distribution of light in a vertical plane. The outside pieces of the refractor carries vertical refracting prisms on the inside surface. These prisms redirect the light laterally or sideways to obtain the correct spread of light across the street. These two pieces of refracting glass are nested and clamped together, enclosing the prisms within a dust-tight chamber.

The refractor is designed for mounting at the side of the road and gives two strong beams of light in opposite directions up and down the road. With the 2,500-lumen (250-candle-power) series lamps the maximum intensity of light in each beam is approximately 5,950 candle-power. The lateral spread is such that a roadway 40 feet wide would be lighted with substantially uniform illumination.

For very wide roads or boulevards and for curved sections of roads a second refractor is available having a still wider distribution of light with correspondingly lower candle-power. It is recommended that these units be mounted at a height of 35 feet from the surface of the road and be spaced from 280 to 420 feet apart.

New Dayton-Dowd Sales Offices

The Dayton-Dowd Company, Quincy, Ill., manufacturers of centrifugal pumps, have announced the opening of consolidated sales offices at 30 North Michigan Avenue, Chicago, Ill. E. E. Maher is in charge of the fire pump department, and A. F. Barron is in charge of the service pump department.

Changes in Sales Personnel

The United States Cast Iron Pipe & Foundry Company, Burlington, N. J., has announced the appointment of H. A. Hoffer as Eastern Sales Manager, with headquarters at the Morris Building, 1721 Chestnut Street, Philadelphia, Pa. G. T. Overholt has been appointed Acting New York Sales Agent with headquarters at 71 Broadway, New York City, and Thomas Simons is appointed Kansas City Sales Agent, with headquarters at Interstate Building, Kansas City, Mo.

Expansion of Bear Tractors Organization

The Sales Organization of Bear Tractors, Inc., 5333 Park Place, New York City, has been expanded through the appointment of H. A. Reed as General Sales Manager, and R. C. Brewsbaugh as Assistant Sales Manager and Advertising Manager. Both will make their headquarters in the New York office.

Mr. Reed has grown up in the tractor business, having been connected with the International Harvester Company, the Case Threshing Machine Company, the Hart-Parr Company, and the Allis-Chalmers Manufacturing Company. Mr. Brewsbaugh has been associated with Mr. Reed throughout this work.

C. A. Bishop has been appointed District Sales Manager of the territory comprising Minnesota, the Twin City Territory, Iowa, the Dakotas, Nebraska, Kansas, Western Missouri, Colorado and Wyoming. Mr. Bishop's headquarters will be in Kansas City. He was formerly with the Hart-Parr Company.

Harvey E. Sewall has been made Assistant Sales Manager, with headquarters in Philadelphia.

The export department of this company will be handled by Pablo Homs, who is said to be one of the oldest tractor exporters in this country.

A New 2½-Ton Commercial Truck

The American-LaFrance Fire Engine Company, Inc., Elmira, N. Y., in December, 1922, began the construction of commercial trucks at its new commercial truck factory in Bloomfield, N. J. In describing this new line of commercial trucks the American-LaFrance interests state that the trucks depend more upon quality of material, design and workmanship for their serviceability and performance than on any particularly noticeable features. Nevertheless, there are certain outstanding examples of engineering progress claimed not to be found to a like degree in other commercial vehicles.



WEST MARKET STREET, YORK, PA.
Paved with Trinidad Lake Asphalt under Pennsylvania State
Specifications.

Standard of the World!

That's the position won and now held by Trinidad Lake Asphalt—the ages-old, ages-seasoned paving material—through its remarkable records of service under every condition of traffic and climate.

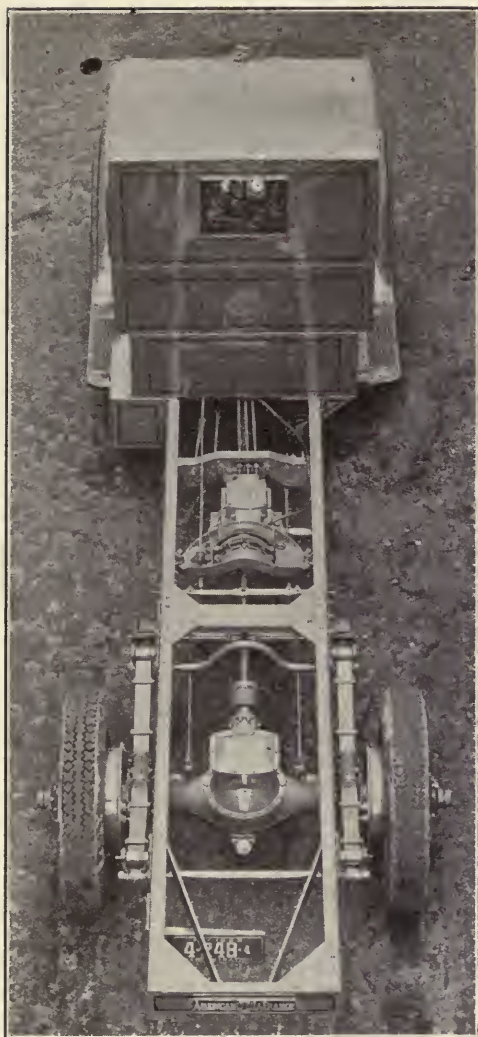
Millions of square yards of Trinidad Paving—on the world's finest streets—from one to 44 years old—are visible proof that it lasts longer and costs less than any other bituminous street-paving material.

Write at once for complete information.

THE BARBER ASPHALT COMPANY
PHILADELPHIA

New York Chicago Pittsburgh St. Louis Kansas City San Francisco

TRINIDAD LAKE ASPHALT



VIEW OF AMERICAN-LAFRANCE 2½-TON TRUCK TAKEN FROM ABOVE

Several of these are patented and are exclusively used in American-LaFrance trucks. These include (1) dry plate clutch with patented self-aligning pressure plate; (2) simplified governor with micrometer adjustment; (3) chrome nickel steel crank-shaft; (4) oil sediment partition; (5) wick-lubricated front axles; (6) disc-type air impeller cooled transmission brake; (7) plastic nickel bronze universal joint, radius and torque rod end bushings; and (8) adjustable brake and clutch lever pads.

Particular attention has been given to securing ease of maintenance and accessibility for repairs. The engine assembly complete with clutch, accelerator pedal rods, levers, etc., can be removed readily as a unit from the chassis. The transmission is so designed that the shifting forks, interlocks and sliding shafts are integral with the gear case cover and hence can be removed as a unit. The service and emer-

gency brakes may be adjusted quickly for wear. These and many other details of design have been worked out expressly for the satisfaction and benefit of the truck user so that less time will be required for maintenance and overhaul.

The 2½-ton model is supplied in three wheel-base lengths, thus permitting the correct adaptation of bodies to suit any particular haulage requirements.

A Shelter for Traffic Officers

Traffic officers are necessarily exposed to the elements because of their locations at street intersections. To overcome this in large measure, J. A. Kelvy & Company, Harrisburg, Pa., has placed on the market a police traffic shelter which is circular in shape and built of water-



A PORTABLE SHELTER THAT PROTECTS THE TRAFFIC OFFICER FROM THE WEATHER



Kansas City Sets a Record!

Thirteen months after the Kansas City Board of Park Commissioners bought four Harley-Davidson Motorcycles, Park Chief Frank Dowd took inventory. *The machines had rolled up a mileage of 28,796 miles and the total cost of upkeep for repairs, tires and oil was only \$79.46—slightly over 1/4 cent per mile!*

No wonder Kansas City swears by the Harley-Davidson, both for city police service and the Park Squad. Over 1,500 other cities and towns have modernized their police departments with this swift, dependable, economical mount. It not only curbs speeders and reckless drivers and aids in the pursuit of motorized crooks, but *it actually keeps crime away.* That's because lawbreakers have a wholesome respect for a Harley-Davidson-mounted officer, and usually do their "jobs" in unprotected towns.

HARLEY-DAVIDSON MOTOR CO.

Dept. M

Milwaukee, Wis.

YOUR city should have Harley-Davidson protection. Write for special literature, showing 1924 models in actual colors. No obligation.

Harley-Davidson
The Motorcycle

1924 Models have
1. Lightweight alloy pistons
2. Alemite lubrication
3. Full-floating sidecar springs
4. Olive Green finish
maroon striped

proof canvas. Two-thirds of the circumference of the shelter is closed with side curtains, which contain three transparent lights through which the officer can watch the traffic in the opposite direction. The shelter is capable of rotation on the base, so that the open portion of the shelter can be faced in different directions, protecting the officer from the elements and permitting him to step out quickly if necessary.

The shelter is 43 inches wide over-all, this being sufficient to allow space for the officer, and small enough to allow it to be set up and used in a narrow place. The particular advantages claimed for this shelter are its complete protection, ease of entrance and exit, the fact that it is easily handled, has little or no up-keep and is water-proof and a non-conductor.

A Swivel-mounted Direction Arrow

The direction arrow which has been adopted by the National Association of Police Chiefs as the proper device for indicating one-way streets, has been developed in a novel and usable way by the Century Sign Company, 100 Colonial Road, Boston, Mass. Inasmuch as it is necessary to place this sign as close to the curb



as possible, in order that it may be prominent, the Century arrow is mounted to swivel, and is so arranged that if a passing vehicle comes in contact with it the arrow will swing out of the way until the vehicle has passed, and will then resume its proper position. The arrow is an aluminum casting with raised letters, the faces of which are covered with black enamel.

Training for Public Administration

The courses in public administration which are given by the National Institute of Public Administration, 261 Broadway, New York City, are administered for two distinct groups: first, for those who are planning to become city managers or to enter public service or civic work and need a broad training and a general knowledge of the major problems and practises of administration; and, second, for those who are already in the public service and desire to improve their knowledge and technique in a particular field of administration. For enrollment in these correspondence courses, applicants must be graduates of liberal arts or scientific institutions of collegiate grade, or offer evidences of equivalent training and experience. City officials who have have not had such training but have had extensive practical experience are eligible for enrollment.

Standard methods are followed in the work of instruction. Lessons are set up involving

the assigned reading and questions based on such readings. When the individual lessons are completed the replies are forwarded to the Institute for review and correction and are then returned to the student. All necessary handbooks and other reference materials are supplied by the Institute, the cost being covered by the tuition fee.

The following courses are available:

Budgets and Budget Making, which considers the relation of budget making to the organization and work of government.

Municipal Accounting, Collection and Management of Funds.—This course covers methods and procedure of auditing control; factors of financial condition, including funding restrictions; interpretation of financial transactions; form and content of financial statements; kinds and uses of general accounting records; cost accounting methods and records; activities and work units for which costs should be kept; procedure in collection of funds; delinquent collections, including tax sales; selection and sureties of depositories; administration of investments, other than those of sinking funds.

Taxation and Revenue.—This course is a general introduction to public finance and lays special emphasis on problems of municipal taxation and revenue. Attention is given to the development of state and local taxation systems; the various sources of revenue; the administration of the different taxes; charges and fees, and special assessments; tax limits; state supervision of municipal taxation; and to the underlying principles of sound municipal revenue systems.

The Assessment of Urban Real Estate.—This course is devoted entirely to the assessment of real estate in cities for purposes of taxation. It deals with modern systems of valuation, unit values, depth rules, corner influence rules, irregular lots, classification of buildings for appraisal, unit factors of value, depreciation, the organization of the assessor's office, appeals, assessors' forms, records and fee systems.

Personnel Administration.—The various problems of public employment are covered by this course, particularly with reference to the responsibility of the executive for the whole range of personnel control, and for the development and administration of a constructive employment policy.

Police Administration.—This is treated and considered under the divisions of historical backgrounds; crime and the police; police control; organization; administrative direction; the uniformed force; the detective division; crime prevention; staff services, selection and training; compensation and welfare; directions for field study.

Matheny with Ahrens-Fox

James G. Matheny, well known in the fire apparatus field, has joined the staff of the Ahrens-Fox Fire Engine Company, Cincinnati, Ohio, and will represent that company in the Kansas City territory, from the headquarters at 212 Westport Avenue, Kansas City, Mo.



Kingston Pike, a section of the Dixie Highway at Knoxville, Tenn. Kyrock surface modified Telford Base. Constructed 1921.

KYROCK has demonstrated that it is possible to build the highest type asphalt pavements at a reasonable cost. It has made asphalt construction practicable in smaller towns as well as cities, and on isolated highways.

Kyrock is laid *cold*. It is shipped in open top cars. It is not subject to damage or chemical change from exposure to the elements. It may be stored in the open, even for a period of years.

Shovels, rakes and roller are the only equipment needed in Kyrock construction. The material may be handled with machinery like sand, stone or gravel. Kyrock is laid directly on any standard type base, without binder course. It is shoveled into place; raked to proper thickness and grade, and rolled. The pavement may be opened to traffic immediately.

Not only has Kyrock eliminated costly plant and equipment, used in ordinary high type pavements, but it has removed the risk of failure due to human error. There is no mixing—no heating. Kyrock is a pulverized bituminous sand stone, or rock asphalt. It is thoroughly mixed by Nature. Nothing is added to Kyrock at any state of its production.

The finished Kyrock pavement is the same in appearance as the finest sheet asphalt. However, it is superior to the hot mix types, in that it does not crack, roll, or shove. Tests of Kyrock in service thirty-five years show no loss of life.

Kyrock pavements are easily and inexpensively maintained. When necessary to cut the pavement the surface may be restored by adding Kyrock and tamping. Records of Kyrock pavements in Kentucky show the 1922 maintenance was one-half that required on other high, hard surface type laid by the State. This, despite the fact that the average age of Kyrock pavements was much greater.

Kyrock is the rock asphalt produced by the Kentucky Rock Asphalt Company, oldest and largest producers of Kentucky Rock Asphalt. The big secret of Kyrock success is uniformity. The rock asphalt is first tested by core drilling in advance of the working. Quarry faces are sampled and analyzed. Pulverized Kyrock is laboratory tested at the mills and re-checked before being shipped. Kyrock produced by this company comes from the same location and is the same by test, as the rock asphalt used in the Camp Knox road and other famous old heavy traffic highways.

Laid on adequate base and with observance of the ordinary principles of pavement construction, Kyrock always gives maximum results.

Kyrock is being used today in half the states of the Union for new construction surfacing and maintenance. Our engineering department has prepared typical specifications and cross sections for Kyrock construction and reconstruction on all standard bases.

Engineers and officials in charge of road and street construction or maintenance should write for specifications and literature before planning their new work. Ask for brochure A. C.

Kentucky Rock Asphalt Co.

Incorporated

711-718 Marion E. Taylor Bldg.

Louisville, Ky.



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No. 3

The American City Magazine

MARCH
1924

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High Surtaxes and Municipal Securities

A Reply to THE AMERICAN CITY'S January Editorial on "Tax-exempt Securities, Tax Burdens and 'Municipal Extravagance' "

By Andrew W. Mellon
Secretary of the Treasury

PRIOR to the imposition of high surtax rates municipal securities had a well-defined and broad market. They were purchased by insurance companies and by conservative investors who no longer desired to continue their capital in private business. They sold upon an interest basis substantially the same as that on which they are now selling and were given preference, by reason of their sound character, over public utility and other private corporation bonds. With the imposition of the high surtaxes, the Federal Government in effect gave a bonus to the municipalities by way of a purely artificial value to the tax-exempt feature of a municipal bond. This value depends not at all upon any power of the municipality nor upon the intrinsic worth of the municipal obligations. We may say that by reason of this bonus the municipality saves one per cent in interest over what it otherwise would pay. It costs the Federal Government, however, to give this privilege, not one per cent of interest, but when the bonds are held by individuals with high incomes the Government loses 58 per cent of the interest. In other words, the municipality might save \$10 a year on a \$1,000 bond, whereas the Federal Government loses in taxes, when the holder has a large income, 58 per cent of \$55, or \$32 on a \$1,000 bond. In other words, taking the two governments as a whole, the municipal-

ity makes only one-third of what the Federal Government loses.

There are now some \$12,300,000,000 of wholly tax-exempt securities available to the large taxpayer, and more and more there is noticeable a flight of capital to these securities. We are bringing into existence a great mass of wealth which is entirely beyond the taxing power of the Federal Government or of the states. Such a type of security seriously threatens the usefulness of the progressive income tax.

I need only touch on the tendency of municipalities, by reason of the ease with which their securities are sold, of incurring heavy obligations to meet which heavy taxes must be imposed. This is one of the major contributing causes to the economic difficulties now affecting the Northwest. In the state of Arkansas, for instance, I am reliably informed the lien of these municipal bonds upon farm property leaves no equity upon which the farmers can borrow money, and farms are being sold for taxes by the hundreds. In that state much of the proceeds from the sale of municipal bonds has gone into roads which are worn out before the bonds mature.

A constitutional amendment is not a complete remedy. It will simply affect bonds subsequently issued. Relief from the intolerable situation existing on account of present outstanding tax-exempt securities

can only be had by a reduction of surtaxes to such a figure that the active man can afford to put his money into productive business and leave municipals to the field in which they belong—to the insurance companies and other conservative, inactive investors. If surtaxes are reduced, I believe that in time the effect of this reduction will be to reduce interest rates and in the end the municipality without the tax-exempt privilege will pay no more for its money than it does now with the tax-exempt privilege.

EDITORIAL NOTE.—Just two days after the foregoing letter was written, vote was taken in the House of Representatives on the proposal to remove, by constitutional amendment, the tax-exempt privilege from future issues of municipal bonds and other governmental securities. The proposal failed to receive the necessary two-thirds vote, and further attempt to secure its passage at the present session of Congress seems unlikely.

Notwithstanding the defeat of the proposal, *THE AMERICAN CITY* is glad to publish Secretary Mellon's letter as a clear and forceful outline of the Administration's point of view; but we are still of the opinion that the \$12,300,000,000 tax-free bonds now outstanding, which were beyond the reach of the proposed con-

stitutional amendment, would have offered sufficient refuge to enable individuals, so inclined, to escape high surtaxes during the continuance of abnormal Federal expenditures resulting from the war. On the other hand, if we assume with Secretary Mellon, that the tax-free privilege means a bonus of one per cent in interest rates to municipalities, the abolishing of this bonus would have affected every bond in all future issues, and not merely such portions of these issues as might be purchased by individuals with high incomes. Increased interest rates on municipal bonds would mean higher local tax rates. Is it not probable that the general public would thus have been compelled to pay, out of one pocket, in increased taxes a sum at least as great as they will lose from the other pocket by the continuance of the so-called bonus to municipalities?

As to the present high surtaxes, Secretary Mellon's argument for their reduction is strengthened, rather than weakened, by the action of the House of Representatives already mentioned.

THE AMERICAN CITY is, of course, in agreement with the Secretary of the Treasury as to the unwisdom of long-time bonds for short-lived improvements. We believe, however, that municipal practice in this matter is steadily improving, and that the problem is one for the states and municipalities to solve, rather than for paternalistic action by the Federal Government.

Relation of Fire Losses to National Wealth

ACCORDING to figures compiled by the New York *Journal of Commerce*, the fire losses for the United States and Canada for the year 1923 aggregated \$389,192,200. This compares with \$410,889,350 for the year 1922.

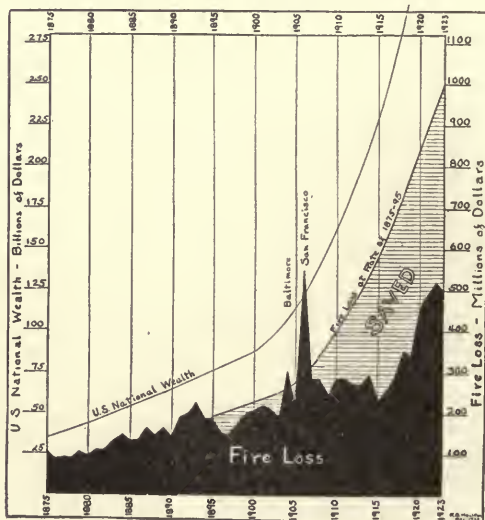
The National Fire Protection Association points out the fact that these newspaper estimates are admittedly inaccurate, but nevertheless furnish a valuable basis for comparison:

"Since the organization of the Actuarial Bureau, its more authentic figures have largely superseded those of the *Journal of Commerce*, though the time required for compilation of complete statistics by the Actuarial Bureau necessarily so delays the publication of these final figures that the *Journal of Commerce* estimates must be relied upon for data on each year's losses until such time as the Actuarial Bureau's final figures are published. On the average for the years when both sets of figures have been available, the Actuarial Bureau's totals have been about one-third larger than those of the *Journal of Commerce*. Estimating on this basis, it may be predicted that final results will show that the 1923 total fire loss for the United States has been approximately \$500,000,000.

"While the total losses of recent years have been so enormous and have been increasing so rapidly that the results of fire prevention efforts have sometimes been questioned, the results seem much more hopeful if the fire losses be compared on the basis of national wealth, an obviously logical basis of comparison, instead of on an absolute basis."

A chart has been prepared by the National Fire Protection Association showing the relation of fire losses to national wealth from 1815 to 1923. In the period 1875 to 1895 the fire loss had a fairly constant relation to national wealth. After 1895 the fire-loss curve begins to fall

away from the national-wealth curve, although peaks are shown representing the Baltimore and San Francisco conflagrations in 1904 and 1906. The chart shows that if the previous relation of fire loss to national wealth had been maintained, the 1923 fire loss would have been one billion dollars, just twice the actual estimated figures. The saving from 1895 to 1923 amounts to a total of approximately \$4,330,000,000.



The New Rapid Sand Filtration Plant at Cambridge, Mass.

By George A. Johnson

Consulting Engineer, New York City

TWELVE years ago filtration of the Cambridge water-supply was recommended by Frederick P. Stearns, Professor Hector J. Hughes of Harvard, and Lewis M. Hastings, City Engineer of Cambridge. Two years later, after an investigation of the watershed, Professors George C. Whipple and J. W. M. Bunker of Harvard also recommended filtration. In 1915 the Cambridge Water Board recommended to the then Mayor and now Superintendent of the Water Department, Timothy W. Good, that such improvements be made, and the writer was engaged to engineer the job.

Plans for a rapid sand filter plant were submitted to the Water Board on October 15, 1915, and the ensuing fourteen months were occupied in hearings by the State Board of Health. Suspension of all other than absolutely necessary public works construction during the World War caused further delay until the present Mayor, Edward W. Quinn, recommended appropriation of the necessary money for construction, which was granted by the City Council in 1920. Contracts were executed on June 28, 1920, with Coleman Brothers, Inc., of Boston, and the Roberts Filter Manufacturing Company, of Darby, Pa.

Ground was broken early in July, 1920, and thereafter construction proceeded rap-

idly until stopped by the severe winter of that year, during which no work was done for ninety consecutive days. The plant was finally ready for operation on April 6, 1923, and was started in full operation on April 25 and officially dedicated on June 28, 1923.

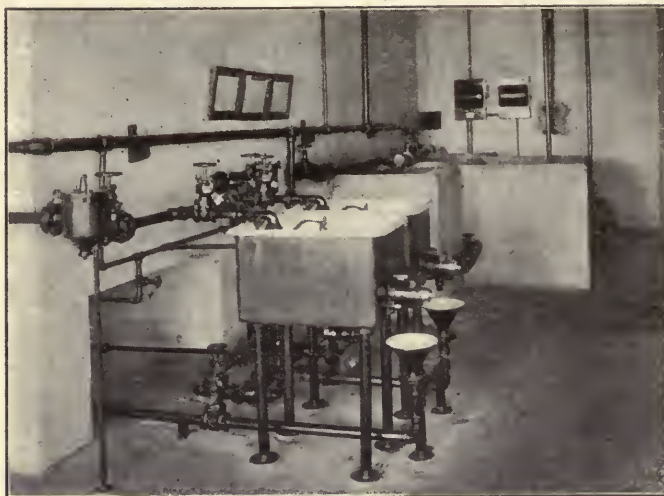
Source of Supply

The Cambridge water-supply is derived from a watershed lying in the vicinity of Waltham, Weston and Lincoln, upon which there is a resident population of some 30,000. The drainage area above the diversion point covers 23.57 square miles. The waters of Hobbs Brook and Stony Brook, which drain this area, are impounded in two reservoirs—one on Hobbs Brook and one on Stony Brook. The Hobbs Brook reservoir has a holding capacity of about 2,500 million gallons, and Stony Brook reservoir has an available capacity of slightly under 400 million gallons. Stony Brook reservoir, from which Cambridge takes its supply direct, is fed from Hobbs Brook reservoir through the natural channels of the brooks between the two reservoirs.

Stony Brook reservoir and the water filtration works are connected by 1.42 miles of 30-inch cast iron pipe, 0.91 mile of 36-inch pipe and 5.2 miles of 63-inch concrete conduit. At the lower end of this aqueduct the



GENERAL VIEW OF FRONT OF FILTER HOUSE AT CAMBRIDGE, MASS.



CHEMICAL DOSING APPLIANCES AT CAMBRIDGE, MASS., RAPID SAND FILTRATION PLANT

water passes direct by gravity to the filter plant, the excess being by-passed over a weir into Fresh Pond, which serves as a receiving reservoir. Fresh Pond drains an area of about one square mile and has an available storage capacity of about 400 million gallons of water.

Water Consumption

Very careful inspection of plumbing fixtures, and the prosecution of other lines of water conservation endeavor, have been instrumental, even in the absence of complete metering, in keeping the water consumption in Cambridge at the remarkably low figure of 100 gallons per capita. In the last twenty years the population has increased about 20 per cent and the water consumption about 27 per cent.

Quality of the Raw Water-Supply

Numerous investigations of sanitary conditions on the catchment area have been made in the last twenty or more years, notably by the late Frederick P. Stearns, Professor William T. Sedgwick, and more particularly by Professor George C. Whipple, of Harvard University. The conclusions arrived at as a result of these investigations were practically the same in all cases. Professor Whipple's investigation was made in 1912-13.

The watershed is similar to many others in the potentialities offered for dangerous contamination. From a population of about 120 per square mile this danger is always

present. There are numerous cases where the brooks run parallel and close to highways, affording easy access of dangerous polluting matter to the streams.

There are strict sanitary regulations operative for safeguarding the water-supply of Cambridge. The difficulties of enforcing such regulations are clearly obvious, and it has long been recognized that their strict enforcement is impossible. Furthermore, no matter how diligent and efficient a watershed patrol may be, it cannot prevent the

pollution of a water-supply derived from surface sources, whether the catchment area be populated or not. Protection of the Cambridge supply by purchase of the entire watershed was out of the question, and in consequence the Water Board has always continued its efforts toward minimizing the pollution of the raw supply, and such efforts are even now continued, although a sure safeguard against the entrance of disease germs into the distribution system of Cambridge is afforded by the filter plant at Fresh Pond.

The color of the Cambridge water-supply is of vegetable origin, coming from decaying vegetable growths in the swampy areas on the watershed. These swampy areas have been drained to some extent by ditching, but further work along this line is highly advisable, because by the swift draining of such areas the color of the raw water could be reduced to a material degree, and a substantial economy in the amount of chemical required for the removal of the color at the filter plant could be effected.

Some have claimed that the natural purification effected in the storage reservoirs is sufficient treatment to safeguard the purity of the supply. In Hobbs Brook reservoir the salutary effect of such purification by storage is far more pronounced than in Stony Brook reservoir, which is long and narrow and allows swift passage of the water through it, especially following heavy

rains on the watershed, accompanied by a strong north wind. In this regard Professor Whipple in his report to the Water Board, dated December 17, 1913, drew pointed attention to the fact that water from the most dangerous feeder of Stony Brook conceivably could reach Fresh Pond in Cambridge within 48 hours, and possibly in a considerably shorter time than that.

A long series of analyses of the reservoir waters discloses an abundance of micro-organisms, as would be expected, and it is such algæ growths that have imparted to the water-supply of Cambridge the obnoxious tastes and odors of which the people have so frequently complained.

In the past all of the water-supply was delivered direct into Fresh Pond, adjacent to which is located the new filter plant. From Fresh Pond the water flowed by gravity into the pump well, thereafter being forced into the distribution system and Payson Park reservoir. The storage in Fresh Pond, which covers an area of some 170 acres, amounts to about one month's supply. The conformation of the shores of the pond encourages material purification of the water, and there is little opportunity for gross pollution from the some 9,000 persons actually resident on the territory adjacent to Fresh Pond. At the present time Fresh Pond is not utilized as a source of supply except at periods when the gravity flow to the filter plant direct from the conduit is insufficient to meet the demand.

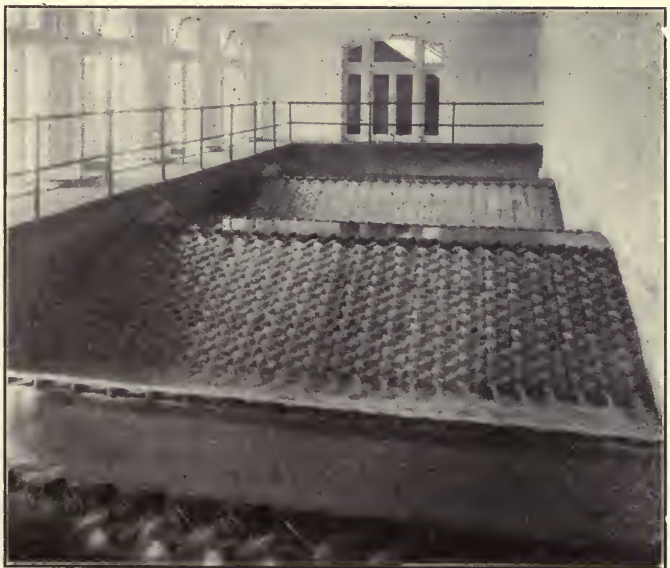
Fresh Pond is a favorable breeding ground for algæ. Not only do algæ growths impart disagreeable tastes and odors to the water, but the organisms and débris resultant from such growths finding their way to the filters speedily clog them, thereby occasioning very frequent washing with the accompanying increased cost of operation. Sharp measures are always necessary during the spring and summer months to check the development of algæ. Treatment with copper sulphate of the

waters of Fresh Pond, as well as those of the upper reservoir, destroys the objectionable growths.

Summed up, it may be said that the raw water-supply of Cambridge is derived from a quite heavily populated watershed, and that the raw supply is always open to the possibilities of dangerous contamination. The water is soft, the hardness averaging about 30 parts and ranging from about 20 to 40 parts per million, of which about one-half is temporary hardness. The color of the raw supply ranges from a maximum of about 50 to a minimum of about 20 parts per million and less, and averages about 25 parts per million. The water is substantially free from high amounts of turbidity. The bacterial content and the *B. coli* count are about what would be expected in a water of this character drawn from a watershed such as that described.

Purification Works

The purification plant has a capacity of 14 million gallons per twenty-four hours and can readily be enlarged to 16 million gallons. The raw supply is delivered to the plant by gravity through 1,480 feet of 42-inch cast iron pipe, leading from a weir chamber situated on the lower end of the 63-inch brick conduit which formerly fed Fresh Pond direct from Stony Brook reservoir. At times when the gravity flow to



AERATORS WHICH EFFECTIVELY REMOVE TASTE AND ODORS FROM CAMBRIDGE WATER



THE PUMP-ROOM OF THE CAMBRIDGE FILTER PLANT, SHOWING VENTURI METERS AND COMPLETE PUMPING EQUIPMENT

the plant is insufficient, the deficiency is made up by taking water from Fresh Pond through a 42-inch intake pipe 320 feet long connecting with the old draft conduit, and pumping through a 30-inch pipe to the 42-inch main supply line.

The purification works are located on city land about 200 feet from Fresh Pond and cover an area of about 1.6 acres. The plant consists of a covered coagulating sedimentation basin, 10 rapid sand filter units, filtered water aerator, clear-water basin, sterilizing equipment, wash-water receiving basin, low-lift pumping equipment and superstructures. The main structures are chiefly reinforced concrete of flat slab and beam and slab type. The superstructure is brick, and the roof is concrete.

The sedimentation basin is constructed of concrete, and is 137 feet by 96 feet and 16 feet in effective depth. Its working capacity is 1.5 million gallons, equivalent to a 2.5-hour flowing-through period when the plant is operating at full capacity. The basin is divided into two bays of equal size by a longitudinal party-wall. A distributing weir and downward baffle are provided at the inlet end. At the outlet end of the basin the water flows off over a skimming weir. Other accessories of the basin are distributing pipes for returned wash water, a sludge pump, overflow and gate chambers. The basin is separated from the clear-water basin by an earth bank 20 feet thick, which insures freedom from any possibility of pollution of the filtered water from this source. There are 10 filter units, built monolithically of concrete, and laid out in one row with a pipe gallery and operating platform along one side. The clarified

water from the sedimentation basin is applied to the filters from a concrete flume running parallel to the pipe gallery. The filter tank units are 20 feet by 24 feet by 9 feet deep, and each has a filtering area of 480 square feet. Thus, when operating at normal capacity, each filter unit handles 1.4-million gallons per twenty-four hours. The filter floor is of the Wheeler bottom type.

The filtering medium is 27 inches in thickness, overlying 9 inches of graded gravel. The buildings and filter equipment are in general conformity with customary up-to-date modern practice, although somewhat more elaborate in certain particulars than that observed in most filter plants.

Conservation of Wash Water

A feature of this plant, which has been made use of in a few other places, is the idea of returning to the sedimentation basin the wash water discharged from the filters. This is effected by collecting the raw wash water as discharged in a covered concrete tank 37.5 feet in diameter and 10 feet deep. When filter washing commences, the wash-water return pump in this basin is started, returning the wash water to the inlet end of the sedimentation basin. There is a 12-inch overflow from this basin leading to the city sewer.

The results of the use of the returned wash water are two-fold: first, encouragement of coagulation activities in the coagulating basin through the medium of the returned wash water, which is heavily charged with pre-coagulated matters which operate as nuclei in the formation of new flocs; and, second, in conserving to the utmost the limited water-supply derivable from the restricted catchment area. The practice is also of benefit in guarding against overloading the city sewer with waste water at inopportune times.

Clear-Water Basin

The clear-water basin is a covered reservoir having a capacity of 4 million gallons. It is 274 feet x 147 feet in plan and carries

a maximum depth of water of 13 feet when the aerator is in operation. The basin extends under the filters on one side, a filtered water conduit runs under the pipe gallery, and the basin is so arranged that it can be by-passed if necessary.

Aeration and Chlorination

The sterilizing equipment is assembled in the headhouse, chlorine being applied to the aerated filtered water. An aerator consisting of sloping concrete slabs in which are set sharp baffles arranged herringbone fashion, releases some free carbonic acid and offensive tastes and odors from the water.

Pumping Equipment

The pumping equipment consists of one 4-million-gallon, two 6-million-gallon and one 10-million-gallon horizontal centrifugal pumping unit to deliver raw water from Fresh Pond to the sedimentation basin when the gravity supply from Stony Brook is insufficient. There are two horizontal centrifugal pumps, each having a capacity of 1,100 gallons per minute, which deliver filtered water into a wash-water storage tank for use in cleaning the filters. There are two vertical centrifugal pumps, each of a capacity of 1,700 gallons per minute, which are utilized to return the used wash water to the sedimentation basin.

All pumps and chemical mixing machinery are driven by alternating-current, direct-connected motors, on a 550-volt, 3-phase, 60-cycle current. The wash-water tank is 29 feet in diameter and 34 feet in

height and holds sufficient water to wash two filters in succession. Wash-water pumps start automatically to replenish the wash-water storage tank as soon as the washing of a filter begins.

The superstructure is a two-story building 223 feet x 71 feet. The wash-water tank is enclosed in a central tower. The first story of the main building is built of concrete, and the second is faced with tapestry brick with synthetic stone trim. The roof is of concrete covered with water-proof membrane. This building houses the filters, administration offices, laboratories, chemical storage, wash-water tank, pumps and all other machinery and devices.

Purification Process

The water first enters the sedimentation basin at the entrance, to which sulphate of alumina solution is added. The treated water is diverted at the entrance to the basin downward to the bottom thereof by means of a baffle, and thereafter passes slowly through the basin. The partially clarified water leaves the basin over a submerged wall which serves as a skimming weir. Thence the water flows through a 48-inch pipe to the influent flume of the filters, being admitted thereto through hydraulically operated sluice-gates on each individual filter unit. Passing the filters, the water is collected by the strainer system, and passed through registering controllers which maintain a constant rate of filtration. The filtered water then flows into a flume, below, through tubes with trapped outlets. Leaving the flume, the filtered water passes



VIEW OF THE FILTERS WITH CONTROL TABLES IN CAMBRIDGE, MASS., PLANT

over the aerator, thereafter receiving a dose of liquid chlorine as a final step in bacterial purification. The ultimate product flows into the clear-water basin and thence by gravity to the Fresh Pond pumping-station for distribution.

At times, particularly following heavy rains or thaws on the watershed, the alkalinity of the raw water falls so low as to make it necessary to add a small quantity of soda ash to the water as it flows through the 42-inch main supply line at a point about 100 feet from the sedimentation basin. This compensates for deficient alkalinity and insures complete decomposition of the added coagulant.

The sludge which accumulates in the sedimentation basin is from time to time pumped out by means of a vertical-shaft, motor-driven centrifugal pump, having a capacity of 1,500 gallons per minute. This sludge is discharged into a near-by sewer.

Cost of Construction

In numerous particulars this plant differs from others, and these facts tended to make its first cost greater than usually is the case. Kingsley Park is particularly attractive and demanded architectural features more ornate than in many places would be considered necessary. Furthermore, the Fresh Pond pumping-station is operating on a 16-

COST OF CAMBRIDGE WATER FILTRATION PLANT
(Analysis from Final Estimate)

ITEM	Bid Price	Net Cost for Additions and Extra Work	Final Estimate	Properly Chargeable to Filter Plant
A Pipe lines outside of masonry structures. . . .	\$90,000.00	\$3,733.56	\$93,733.56	\$25,000.00 (a)
B Sedimentation basin, substructures of buildings and filter structures.	328,000.00	35,406.05	363,406.05	271,000.00 (b)
C Superstructures.	80,000.00	3,418.61	83,418.61	83,418.61
D Filter equipment.	225,900.00	207.00	225,693.00	225,693.00
E Chlorinator.	1,400.00	0.00	1,400.00	1,400.00
Total.	\$725,300.00	42,351.22	\$767,651.22	\$606,511.61

(a) Estimated cost of all outside piping, \$89,850. Figure given is for normal amount of such pipe lines.
(b) Estimated cost of 4 m. g. clear-water basin \$138,400. Allowance of \$45,993.95 made for a basin of normal size.

Rated capacity of filter plant.	14,000,000 gallons daily
Bid price.	\$725,300.00
Final estimate.	767,651.22
Extra work.	42,351.22 (5.8 %)
Allocated cost of filter plant.	606,511.61
Cost per m. g. rated capacity.	43,322.26

The filters are washed by passing currents of filtered water at high velocity up through the filter beds. The dirty water is collected in gutters at the top of the filters and drained off to the receiving basin, whence it is returned by pumping to the inlet end of the sedimentation basin. All valves in the filter and washing process are controlled from operating tables which are uncommonly substantial and ornate, being constructed of marble, bronze and plate glass.

hour schedule out of every 24, and this made it necessary to provide an abnormally large clear-water basin in which to store water against a 50 per cent overdraft during the pumping period. The aerator and the wash-water receiving tank with piping connections and pumping equipment are other unusual items. The long connecting pipe lines furnish still another abnormal item of expense.

ACKNOWLEDGMENT.—From a paper read before the New England Water Works Association Convention at Burlington, Vt.

National Garden Week—April 20-26

With the slogan, "The U. S. A.—Garden Nation of the World in 1930," and with the endorsement of President Coolidge, the General Federation of Women's Clubs is promoting the observance of April 20-26 as National Garden Week. Cooperating with the Federation are the Department of the Interior, through the Bureau of Education, the Department of Agriculture, through the Extension Service, the Forest Service and the Bureau of Plant Industry. A list of Garden Week suggestions and an outline of activities for each day of the week can be secured from Mrs. John D. Sherman, General Headquarters, General Federation of Women's Clubs, 1734 N Street, N. W., Washington, D. C.

The Public Works of the New Model Town, Mariemont, Ohio

By R. W. Horne

Fay, Spofford & Thorndike, Consulting Engineers, Boston, Mass.

MARIEMONT, an interesting example of modern town planning and development, is now under construction just outside Cincinnati, Ohio, along the slightly bluffs overlooking the Little Miami River. The completion of this town will achieve the goal of years of careful thought and planning on the part of Mrs. Mary M. Emery of Cincinnati and Charles J. Livingston, manager of Mrs. Emery's extensive properties. Mrs. Emery is to spend millions for the establishment of this modern community to promote the happiness and contentment of citizens of moderate circumstances and to provide, within their means, the conveniences and necessities of life consistent with present-day American standards of living; only a minimum property rental will be charged, which will be just sufficient to pay a moderate return upon the capital invested.

The Town

The development, comprising some 365 acres, will be provided with complete underground utility systems of the most modern and approved types. There will be about 11 miles of improved streets, paved in accordance with the best practice. Homes for a population of more than 7,000 people will be provided by constructing houses of various kinds, such as apartments, group houses, and semi-detached and detached houses. There will be ample opportunity for amusement and recreation, education and worship through the establishment of parks, playgrounds and athletic fields, schools and churches.

A feature of the town will be its attractive Town Center and Village Green, situated at the convergence of several important thoroughfares. About the Town Center there will be numerous public buildings and business establishments, including a town hall, library, community club house, hotel, theater, post office, bank, stores and business offices, and a public market place. Industrial sites with excellent railroad



WATER-MAINS BEING LAID IN MARIEMONT, OHIO, READY FOR POURING LEADITE JOINTING MATERIAL

facilities will be available. The industrial area, when completely developed, will provide employment for 3,000 to 4,000 workers.

Utility Structures

Mariemont affords an exceptional opportunity for building each of the several underground utilities as a complete municipal unit and in accordance with a preconceived plan designed to serve the entire development. The installation of the water-supply, sewerage and storm-water drainage systems has been practically completed, and underground structures for the distribution of gas and electricity and heat from a central heating plant are to be built previous to the construction of streets and buildings. All service connections are to be installed as far as the property lines at the time of building the various utilities, thereby eliminating the need of disturbing finished

street pavements for such constructions. The evenness and regularity of the town site and the exceptionally favorable material encountered, namely, clay, silt and sand carrying scarcely any ground water, offered very favorable opportunity to use modern trenching and backfilling machinery, and much of this kind of equipment has been employed on the work. The stability of the trenches makes sheeting unnecessary where the depths are less than 12 to 14 feet.

Water-Supply

The water-supply for Mariemont is taken from the mains of the Cincinnati water-works; two entirely independent supply mains have been constructed to convey the water to the town site. The supply mains and the distribution mains are of cast iron, the supply mains being mostly 12 inches in diameter, and the distribution mains ranging from 6 inches to 12 inches in diameter. The entire distribution system is laid out as a gridiron with practically no dead ends. Gate-valves are so placed that in general only one side of a block will be shut off from water for making pipe line repairs. Fire hydrants are the 5-inch two-way type and are spaced at intervals of 300 to 350 feet. Hydrant branches are 6 inches in diameter and are provided with secondary gate-valves. Water-mains are assigned a standard location under the sidewalks where there will be a minimum damage and inconvenience from breaks. The mains are laid with a minimum cover of $3\frac{1}{2}$ feet; Leadite joints are used throughout. Because of the corrosive activity of the Cincinnati water, the use of either lead or

brass for all house service pipes was considered advisable. Pressures at Mariemont average about 150 pounds per square inch, thus making necessary the use of particularly strong pipe for house services. At the time of letting the contracts for the water system the cost of brass pipe compared very favorably with that of extra-heavy lead pipe, and in consequence the use of brass was adopted for all services.

Sewers

The separate system of sewers was adopted in order to keep the quantity of sewage a minimum, as sewage treatment will eventually be necessary. The separate system was advisable also because of the numerous opportunities for the discharge of storm water without going to the expense of carrying all storm water to a common point of discharge. Main sewers are entirely of vitrified pipe ranging from 8 inches to 20 inches in size. They have a standard location along the center lines of the streets. All sewers are designed large enough to serve the entire natural drainage area tributary to the system, whether this area is within or outside the town limits. The layout of sewers is such as to convey the sewage as rapidly as possible to one point by gravity, and discharge it through an outfall sewer into the Duck Creek interceptor, which is part of the Cincinnati sewerage system.

A feature of the system is a 10-inch cast iron siphon dipping 40 feet below the normal hydraulic grade line. The outfall sewer will be carried across a deep ravine upon a reinforced concrete highway bridge,



SEWER IN MARIEMONT, OHIO, SUPPORTED ON LEAN CONCRETE WALL WHERE THE GRADE OF THE SEWER LIES ABOVE THE NATURAL GROUND SURFACE

carrying special provision for supporting water-mains, sewers, and other utility structures. Several instances occur where sewers must be built a few feet above the natural ground surface in order to hold the proper gradient. These cases are where future streets will be built in fill; as a precaution against settlement, the pipes are supported on a wall of lean concrete.

Storm-Water Drains

The storm-water drains range from 10 inches to 66 inches in diameter; small sizes are of vitrified clay pipe, and sizes 24-inches or more in diameter are of precast reinforced concrete pipe. The drains are located in the streets a fixed distance from the sewers and on the opposite side from the water-mains. Abnormally large sizes of pipe are required in several instances, to provide for the run-off which originates on drainage areas outside the town limits, but eventually reaches the drains. The entrance of storm water into the drainage system will be entirely through street inlets, no catch-basins being provided. In a development such as Mariemont, streets will be kept practically free from dirt and other material which might enter the drains and clog them, and no trouble from this source is anticipated, especially as drains are built to produce self-cleansing velocities.

Cost of Utilities

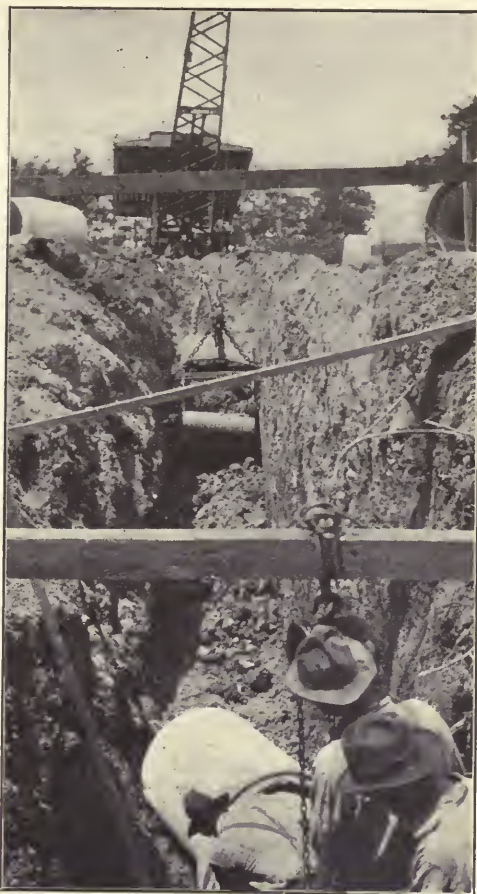
The cost of the two water-supply mains was about \$72,000, and the cost of the water distribution system complete about \$209,000. There are about 1.6 miles of distribution mains per 1,000 people served, and the cost of the complete distribution system, including house services but exclusive of supply mains, was about \$18,000 per mile of main.

The sewer system cost about \$126,000; there are 1.35 miles of main sewers per 1,000 people, and the cost of the complete system, including house connections, was about \$12,800 per mile of main sewer.

The cost of the storm drainage system was about \$249,000. There are 1.25 miles of main drains per 1,000 people, and the cost of the drainage system complete was about \$27,900 per mile of main drain.

Highways and Highway Bridges

The town will have two important through-streets. One, Wooster Pike, passes



DRAG-LINE MACHINE EXCAVATING TRENCH FOR DRAIN IN MARIEMONT, OHIO

through the center of the town, and the other, Mariemont Avenue, completely bypasses the Town Center and furnishes an alternate route for through-traffic. These two streets join at both the eastern and the western town limits.

The construction of a highway bridge is necessary in order to make the Mariemont Avenue route available. This bridge will be a simple reinforced concrete structure, 306 feet long, having seven narrow arch spans and a 35-foot roadway with two 6-foot sidewalks.

Paving

Several different types of street paving will be provided, depending upon the severity of traffic conditions. Pavements for heavy-traffic streets are to be sheet asphalt on a concrete base. The major through-streets are to be paved with bituminous



BACKFILLING DRAIN TRENCH BY MACHINE

macadam on a heavy base; other through-streets are to be a lighter type of bituminous macadam. Residential streets are to be either gravel or macadam having an asphaltic penetration top. Service streets about the Town Center will be of concrete.

Progress

Construction of the water-supply, sewerage and drainage systems was begun the first of May, 1923, and has been practically completed in about eight months' time.

The water system includes about 2.5 miles of cast iron supply mains, 11.5 miles of distribution mains, and 3 miles of $\frac{3}{4}$ -inch brass service pipes. There are approximately 10 miles of vitrified sewers and 5 miles of 6-inch vitrified house connections. The storm-water drainage system includes 9 miles of vitrified clay and "precast concrete" drains and 2 miles of 6-inch vitrified roof-water connections. During 1924 it is expected that construction of the remaining underground utilities, the streets, the highway bridge, possibly the central heating plant and several hundred houses will be completed.

John Nolen, the town planner, has associated with him in the carrying out of this project Fay, Spofford & Thorndike, consulting engineers, of Boston, who prepared the engineering designs and are supervising the construction of the engineering features.

Municipal Ownership in the Manufactured Gas Industry

THAT the supply of manufactured gas to the municipalities of the United States is still to a very great extent under private management is shown by a compilation of available statistics on gas companies.*

Of the 966 gas utilities in the country, only 51, or 5 per cent, are municipally owned or operated, while the total annual sales of gas for the two classes show that those under municipal management are selling only 6,000,000,000 cubic feet, as against 365,000,000,000 cubic feet sold under private management, or 1.6 per cent.

Other figures on meters, miles of mains, and population served make the contrast even more striking. For example, of the more than 9,000,000 meters in use, municipal companies can account for less than 153,000. Of the 70,000 odd miles of gas-mains in the United States the municipal companies have less than 1,900, and out of a total of 45,000,000 people served by manufactured gas, only 762,000, or less than 2 per cent, get their gas from city-owned plants.

It is shown that the 51 municipal properties are situated in 21 states, the largest number of plants for a state being Minnesota, with 6; Virginia, with 5, and Georgia, Iowa, and Mass-

achusetts, with 4 each. The largest plant under municipal control is in Omaha, Nebr., with total annual sales of 1,396,000,000 cubic feet. The next two in line are in Richmond, Va., with sales of 1,159,000,000 cubic feet, and Duluth, Minn., with sales of 802,800,000 cubic feet. These three companies alone, according to official statistics, sell approximately 80 per cent of the total amount of gas sold by all the city-owned plants in the country.

The remaining 20 per cent is sold by companies operating in small towns, summer resorts and hamlets, with 24 companies having less than 20 miles of gas-mains per company.

As against the 6,000,000,000 cubic feet of gas sold annually by all the municipal plants combined, it is shown that the People's Gas Light and Coke Company, of Chicago, sold 27,600,000,000 cubic feet, while other private undertakings reported such sales as Philadelphia, 18,000,000,000 cubic feet; Boston, 8,600,000,000 cubic feet; St. Louis, 7,000,000,000 cubic feet, and San Francisco, 6,000,000,000 cubic feet.

* "Municipal Ownership Survey of the Manufactured Gas Industry," issued January 30, 1924, by American Gas Association, New York, based on 1923 Edition, Brown's Directory of American Gas Companies.

Improving Our County Government

By Mary C. Hamilton

Secretary of the Westchester County Government Commission

AS far back as the year 1914, Westchester and Nassau Counties, in the state of New York, appointed commissions to examine their local governments and to suggest improvements thereto. The Westchester County Commission, as then constituted, consisted of four Republicans and three Democrats, and it is interesting to note that of these seven, six are still members. This commission in due time made its report and recommendations, but it was not until November, 1921, that a constitutional amendment was finally passed authorizing Westchester County to adopt a new form of government, subject, of course, to the approval of its citizens.

If you had journeyed to White Plains, the county-seat of Westchester County, the past year, you would have found a notable group of thirty public-spirited men and women, known as the Westchester County Government Commission, meeting from week to week in an endeavor to formulate a simple, workable plan for the local government of a community which has changed from mostly rural to almost entirely urban. To-day the population of Westchester County is approximately 400,000, made up of four cities, twenty-three incorporated villages and numerous hamlets, and yet the form of government is substantially the same that existed at the close of the Revolution, when the total population of the county (in 1790) was only 24,000.

While the problems confronting Westchester and Nassau Counties are in many respects peculiar to communities contiguous to large cities, there are many districts in the United States laboring under similar conditions. The two commissions are, therefore, afforded an opportunity of doing some pioneering in county government and of setting an example for other districts.

One of the questions often put to the Westchester Commission is, "What is the real trouble with our county government—the real cause of waste and inefficiency?"

Our answer is, that we lack a compact, logical organization of departments under one head, with adequate administrative and budgetary powers vested in that head.

For example, there are at present forty-one super-

A Neglected Unit of Government

County government to-day is the most neglected of all American units of government, particularly in the eastern part of the United States. The average voter will show a lively interest in city, state and national government, but for county government his concern is apathetic and his theories are hazy and impractical. The Joint Committee of the New York Legislature on Taxation and Retrenchment, in discussing county government, is quoted as saying:

"The old system of county government has broken down entirely in our purely urban counties, and leading citizens and civic bodies in those counties are already actively urging corrective legislation. . . . The mixed counties are in a most unhappy state. In them the old county system is slowly cracking under the tremendous and rapidly growing administrative burdens created by the rapid development of these counties."

visors in Westchester County, eighteen of whom are town supervisors and as such are executive heads of the town government. In other words, the town supervisor is the chief officer of his town—he is a representative of his town on the County Board of Supervisors and as such fixes the town budget and has charge of all money matters.

The time has been when this governing body that we call our Board of Supervisors, which meets only at stated intervals, was sufficient for all needed governmental requirements in the county, but to-day, when the running of a county has become such a complex administrative problem, it needs

the constant and active supervision of a trained executive as well—some one who can be held responsible for the preparation of the county budget and for the proper administration of all departments of a county government.

Among other things which the Westchester County Commission has unearthed in its study of county problems, have been some 3,000 special and general laws, and some 4,000 amendments, that have been passed by the State Legislature at Albany, affecting Westchester County alone. A considerable saving and advantage might follow the creation of a county legislative body able to pass on strictly local laws, unmolested by the State Assembly.

The Commission has also discovered that under its present form of government Westchester County has 32 separate police departments; 32 separate departments of public works, or departments corresponding to it; nearly 50 different taxing districts; between 25 and 30 unrelated boards of health; the same number of independent purchasing departments; and about 130 people who can commit children to the poorhouse. Do you wonder that confusion and complication result from such a lack of coordination and cooperation?

Seventy-Two Justices of the Peace—What to Do with Them?

Another problem which has confronted the Commission is the one relating to inferior courts. At present there are seventy-two justices of the peace in Westchester County. The functions of these officers were established years ago to meet primitive rural conditions, and the officers are not required to be lawyers; in fact, most of them are untrained men. They become ex-officio members of the Town Board and in such capacity fill an executive as well as an administrative office.

In its consideration of this important question, the Subcommittee on Inferior Courts was unable to reach a unanimity of opinion and in consequence submitted two reports to the whole Commission, the majority report recommending the retention and preservation of the office of justice of the peace with certain specified changes in the present system, while the minority report advocated the abolishment of the judicial functions of justice of the

peace as well as police justices in towns and villages, dividing the county outside of cities into districts and creating a District Court in the county to be presided over by lawyers of at least five years' legal standing. The views expressed by members of the Commission, following the filing of these two reports, showed such a wide difference of opinion that it was finally agreed to formulate the recommendations of this subcommittee into a separate report to be submitted to the Board of Supervisors.

In this connection it is interesting to note that the Nassau County Commission, in its preliminary report to the Board of Supervisors of Nassau County, recommended the abolishment of the office of justice of the peace and the creation in its stead of four local court districts, each to be presided over by a judge, elected for a term of four years.

Personnel of Commission and Recommendations in Final Report

In the selection of the thirty members who make up the personnel of the Westchester Commission, great care was exercised to gather together men and women with specific knowledge of the varied and technical problems to be solved. The Commission has operated through sixteen subcommittees and has been free, so far as restrictions were concerned, to recommend any form of government that it believes the electors of the county would approve.

In its final report to the Board of Supervisors the Commission will recommend the election of a County President who will be vested with the executive power of the county, with general supervision of all its affairs. In addition, there will be a County Vice-President, who will act as chairman of the Board of Supervisors, and a County Commissioner of Finance, who will be the chief financial officer of the county. These three elected officials will constitute a Board of Estimate and Apportionment, whose functions will include the granting of all franchises, incurring of all indebtedness, fixing the number, position and salaries of officials and employees not determined by statute, preparing and submitting the annual budget of the county, and having general supervision of all contracts and purchases for the county exceeding the sum of \$500.

In like manner, the commission will recommend that the legislative power of the county be vested in a Board of Supervisors, elected from the units now represented in the Board, with authority to enact ordinances for the government of the county not inconsistent with law.

It has also been agreed by the Commission that its final report to the Board of Supervisors shall recommend the incorporation of broad general powers in the new county charter looking to the establishment of a County Department of Public Welfare; a County Health Department with a County Health Commissioner to work in connection with the State Board of Health; a County Board of Equalization and Review; a County Zoning and Planning System; a Bureau of Information and Statistics; a County Transit Commission; a County Park Commission, and a provision giving the county the right to construct and maintain water and sewer systems and public highways where these pass through more than one municipality.

The question of the educational reorganization of the county has also been given a great deal of study and consideration by the Commission. Owing to its great local importance, however, members of the Commission have agreed that the question of education should be treated separately from the question of a change of form of government, and they will, through their Subcommittee on Education, develop a plan for the reorganization and improvement of the public school system which will later be submitted to the State Legislature.

The construction to be placed upon some of the constitutional provisions, the extent to which power and responsibility can be lodged in one person, the limitations to be imposed upon the free exercise of the

legislative power of the Board of Supervisors, are questions that have proved the great debating ground not only at the conferences of the Subcommittee on Questions of Law, but at the gatherings of the whole Commission. Because of a lack of unanimity on these important questions, it has been found wise to employ eminent constitutional lawyers to pass on certain unsettled questions before submitting the final draft of charter to the Board of Supervisors.

Inasmuch as the law providing for a change in our county government contains a provision that such proposed change must be submitted "to the electors of any such county at a general election in an odd-numbered year," the recommendations of this Commission cannot be voted upon by the people of Westchester County until the year 1925. This will give the Commission the time necessary to complete the details of its report, which must in the first instance be filed with the Board of Supervisors and then passed on by the State Legislature before submission to the electors of the

county for their approval and adoption.

Throughout its deliberations the Commission has unanimously held to the belief that local interests, which constitute the very essence of responsible citizenship, shall not be ignored. Every function that can be maintained by the town, should, in the opinion of the Commission, be left to it, subject, of course, to supervisory check by the county. It is only functions such as water-supply, sewers, maintenance of highways, and general questions too big for any one municipality to handle, that the Commission would unify and coordinate; proper provision being made in the charter for the increase of powers and functions as public necessity demands.

Officials to Be Elected in Proposed Charter for Westchester County

With **EXECUTIVE** and **ADMINISTRATIVE** powers
(These three officials to constitute the Board of Estimate and Apportionment.)

With **LEGISLATIVE** power

**SURROGATE
COUNTY JUDGE
JUDGE OF CHILDREN'S COURT
SHERIFF
DISTRICT ATTORNEY
COUNTY CLERK
REGISTER
COUNTY TREASURER**

NOTE: All heads of Departments other than Commissioner of Finance and Commissioner of Jurors, to be appointed by County President.

County Pres.
County Vice-Pres.
Commissioner of Finance
(Comptroller)

Forty-one Supervisors
(To be elected from each town and each ward in a city.)

Mansfield, Ohio, Resurfaces Brick Paving with Asphalt

By Carl H. Stander

Mayor and formerly Director of Public Service and Safety, Mansfield, Ohio

MANSFIELD, Ohio, has 44 miles of paved streets, which gives a larger percentage of improved thoroughfares, namely, 60 per cent, than in most cities. The first brick paving was laid approximately 40 years ago and, because of the quality of the brick, had become worn and cobbled.

Under the existing law, the city was compelled to assume 50 per cent of the gross cost, plus the cost of intersections for repaving. This, and a depleted treasury and rapidly soaring bonded indebtedness,

of time would have seriously complicated the traffic situation.

An examination of the old pavement showed that the old brick had worn to a fraction of their original size, but the substantial foundation, consisting of hard sandstone spalls 12 to 18 inches in depth, supported them. With ideal drainage conditions, these foundations, which had been compacted through years of use, could hardly be improved. Therefore, resurfacing was decided upon.

For the resurfacing work a 1½-inch



THE PUBLIC SQUARE, MANSFIELD, OHIO, THE HEAVY-TRAFFIC STREETS OF WHICH ARE NOW PAVED WITH A TEXACO ASPHALT SURFACE OVER BRICK

made it impossible to repave a sufficient yardage each year to keep up with the yardage which was wearing out—without considering additional paving in the outlying districts.

All the streets that were in need of repair were in the business district. Merchants and business men are naturally adverse to having the streets in front of their places of business barricaded any longer than is absolutely necessary. Removing old paving material, excavating, placing concrete, hauling and laying brick is a season's work for many contractors. The loss of the use of the streets for such a length

wearing course and a 1-inch binder course, using Texaco asphalt, were selected. The new surface was placed on the worn brick after they had been thoroughly cleaned of dirt and other foreign matter. This type of improvement cost less than one-third the gross cost of repaving, and in no case was any business house without the use of the street for a period longer than 24 hours. About 25,000 square yards of roadway were resurfaced last year, including the four streets surrounding Central Park and comprising the route of both the Lincoln and Harding Highways through Mansfield.



THE CITY MOTOR EQUIPMENT OF LYNCHBURG, VA.

Motor Equipment in Service in Lynchburg, Va.

City a Firm Believer in Motorized Service

THE two illustrations appearing on this page show a portion of the motor equipment in use in Lynchburg, Va.

The city motor truck equipment for general city service now includes four ½-ton Fords, thirteen 1-ton Fords, one Fordson tractor, one 2-ton Jeffrey Quad, two 2-ton Nash Quads, two 3-ton FWD trucks, and two 3½-ton Kelly-Springfield trucks. This

makes a total of twenty-four motor trucks and one tractor for general city service for a city of about 30,000 population.

The fire department equipment for Lynchburg, according to E. A. Beck, City Manager, consists of one Seagrave aerial ladder, four American-LaFrance pumpers, one Seagrave pumper, and one American-LaFrance hose truck.



A STREET-SPRINKLING AND CLEANING COMBINATION THAT HAS PROVED SATISFACTORY
This tractor-drawn street-cleaning unit, built in the city shops from an old horse-drawn sweeper with the addition of a tank, has replaced two pieces of street-cleaning equipment in Lynchburg

The Operation of Imhoff Tanks for Sewage Treatment

By Earle L. Waterman

Associate Professor of Sanitary Engineering, University of Iowa

THE Imhoff tank for sewage treatment is a two-story settling tank originally designed by Dr. Karl Imhoff and first constructed in 1905 by the Emscher Drainage Board in the province of Westphalia, Germany. After several years of successful operation in Germany, the Imhoff tank was introduced into America. The first tank of this type to be built in the United States was installed at Madison-Chatham, N. J., in 1911. Since that date Imhoff tanks have been built in nearly every state in the Union. It is estimated that about one-third of all sewage settling tanks used in municipal plants in the United States are of the Imhoff type.

The essential features of an Imhoff tank are the settling chamber, sludge compartment and gas vents. Sewage entering the tank flows through the settling chamber at such a low velocity that about 60 per cent of the settleable solids fall down to the sloping bottom of the settling chamber and then slide down through slots into the sludge compartment. The slots are so arranged that the gas, which is a by-product of the sludge digestion, cannot rise through the slots and into the settling chamber. In a septic tank, which is a one-story tank, the gas does rise through the sewage which fills the tank and in doing this lifts some of the partially digested sludge back into the sewage. As a result, the effluent (water flowing away) from the septic tank contains a higher percentage of suspended matter than that which leaves an Imhoff tank. Thus we see one of the important reasons for having a two-story tank.

Besides preventing the resuspension of settled solids in the sewage, the design of an Imhoff tank also prevents the liquid as well as the gaseous products of sludge digestion from coming into contact with the sewage as it passes through the settling chamber. Experience has shown that by preventing such a mixture an effluent is obtained which is more readily treated in subsequent processes.

The compartment underneath the settling chamber, into which the solids fall as they pass through the slots, is called the sludge compartment. This is a storage space in which digestion or rotting of the organic matter which has settled from the sewage takes place. Digestion of this organic matter is very largely the result of the activities of innumerable bacteria. As the fresh particles of suspended matter come into the sludge compartment, the bacteria attack it and break it up into different products, some of which they utilize as food. During this process a considerable quantity of gases are formed, the principal one being methane, which is the same gas used for illuminating and heating purposes. Recently the engineers of the Emscher Drainage Board in Germany have devised a method for collecting the gas from Imhoff tanks so that it may be used. In one instance, the supply collected is sold to the municipal gas company and is used in the same way as that manufactured in the company's own plant.

In the Imhoff tank the gases which form during the process of sludge digestion rise until they strike the sloping bottom of the settling chamber, which deflects them into the gas vents, from which they discharge into the air above the tank. As the gas rises, some of the finely divided sludge is lifted by it to the surface of the gas vent, and in time a scum of considerable thickness is formed. If this scum is allowed to accumulate, it will act as a cover on the vent, which will be gradually lifted as the pressure of the gas below it increases, and will eventually be forced out over the sides of the vent and fall back into the settling chamber. In order to prevent this, it is essential that the scum be broken up frequently so that it will fall back into the sludge compartment and allow the gas to escape freely.

A considerable portion of the solids which fall into the sludge compartment is left after the bacteria have completed their

work on it. This is now what we call digested or ripened sludge and contains a very large percentage of moisture. As the tank continues in operation, there is a gradual accumulation of ripened sludge, and eventually the amount becomes so large that it is necessary to draw it out of the tank through the sludge pipe. Properly digested sludge as it is drawn from the tank has the appearance of thin, black mud. It usually flows readily and is allowed to flow out onto sludge drying beds. In fair weather it will drain and dry in a week or

tematic operation of the tank is necessary. Experience has shown that attention should be given to the following schedule of operation:

1. *Cleaning screens and grit chambers.*—Coarse screens are usually installed for the purpose of removing coarse material, such as rags, pieces of wood, and other foreign substances from the sewage before it enters the Imhoff tank. These screens should be cleaned daily and the screenings buried. Where storm water is handled by the same sewer that carries the domestic



TYPICAL SMALL IMHOFF TANK INSTALLATIONS IN IOWA

1. Housed Imhoff tank and outdoor trickling filters at Charles City, Iowa. 2. Housed Imhoff tank at Jewell, Iowa. 3. Imhoff tank sludge on drying-bed at Ames, Iowa. 4. Covered Imhoff tanks at Brooklyn, Iowa. 5. Interior view of housed Imhoff tanks at Ames, Iowa, showing settling-compartments and gas vents. 6. Housed Imhoff tanks, Iowa State College, Ames, Iowa, showing recently drawn sludge on the drying-bed. 7. Sewage treatment at Ames, Iowa, showing Imhoff tanks, dosing-chamber and trickling filter

ten days so that it can be easily handled with spades. It should now resemble dark garden soil, and it has about the same physical characteristics.

Operating Procedure

If Imhoff tanks are to accomplish the results which they are designed to accomplish, namely, give an effluent comparatively free from suspended solids and the products of sludge digestion and produce a sludge which is free from disagreeable odors and will dry readily, careful and sys-

tematic operation of the tank is necessary. Experience has shown that attention should be given to the following schedule of operation:

2. *Cleaning the sides and bottom of the settling chamber.*—Once every week the sides and bottom of the settling chamber should be cleaned. Very frequently growths attach themselves to these surfaces and serve as miniature catch-basins for the settling solids. Unless they are removed, undesirable septic action may be started in

the settling chamber. This cleaning should be done with a squeegee, a hardwood board 12 to 15 inches long and 3 to 4 inches wide, having rubber edges and attached to a handle which is of sufficient length to reach down to the slots in the bottom of the sedimentation chamber. A heavy chain attached to the end of a rod may also be used to clean the slopes and the slots in the bottom of the settling chamber.

3. *Removing floating material from the sedimentation chamber.*—Material which floats on the surface of the sedimentation chamber, such as grease, matches, corks, etc., and sometimes scum, should be removed with a skimmer and placed in the gas vent chamber. If this is not done, septic action may set in. As we have already noted, septic action is undesirable in the sedimentation chamber. A very satisfactory skimmer may be made from woven wire having about 10 meshes to the inch. A hoop of $\frac{1}{4}$ -inch iron rod is attached to a long wood handle, and then the woven wire is bound to the hoop in such a way as to form a dish-shaped skimmer.

4. *Equalizing the deposit of sludge.*—If the construction of the tank permits, it is advisable to reverse the direction of flow through the sedimentation chamber. As the sewage flows through the tank, a large part of the suspended matter settles out near the inlet. This results in building up a sludge deposit which is higher near the inlet than it is at the outlet. By reversing the direction of flow once every month, a more even distribution of the sludge deposit can be obtained.

5. *Treatment of scum on the gas vent chambers.*—The scum which forms on the surface of the liquid in the gas vent chambers should be broken up at least once a day. If this is not done, the action of wind and sun will form a tough, leathery surface through which gas cannot pass. The result is that the scum is lifted by the confined gases and is sometimes pushed over the side walk of the vent chamber and falls into the sedimentation chamber. Even in Imhoff tanks, where housing protects the scum from weather action, there is often a tendency toward consolidation of the scum on the surface. The breaking up of the scum may be accomplished with hoes or by water from a nozzle. In one case which has recently been reported a walking beam

has been arranged so that continual agitation of the scum in the vent chambers is obtained. This of course requires some kind of power, but in the case referred to, the results have apparently justified the expenditure for equipment and power. This matter of keeping the gas vents functioning properly seems to require more attention on the part of the operator than any other single phase of Imhoff tank operation.

6. *Observing depth of sludge.*—It is important to know the depth of sludge in the sludge compartment. Observations to determine this depth should be made at least once a week. If the sludge compartment is divided into two or more pockets, the depth of sludge should be determined in each pocket. This may be done by means of a sheet-iron plate 12 to 18 inches square attached to a wire or cord or long, light, wooden rod in such a manner that it will sink in a horizontal position. When it reaches the top of the sludge, the rate of sinking will be checked, and at this point the depth should be observed. This observation can generally be made through the gas vent chambers.

7. *Drawing sludge.*—In a normally operating Imhoff tank, sludge should be drawn when the sludge compartment is filled to within 20 inches of the slots. The valves in the sludge outlet pipes should be opened very slowly. As the sludge begins to flow freely, close the valve, let it remain closed for two or three minutes and then slowly open it again. By doing this, a chance is given for the heavy sludge in the bottom of the sludge pockets to start moving toward the sludge pipe. Quick opening of the valves may result in drawing sludge from the top instead of the bottom of the compartment. It is the bottom sludge that should be removed. If there is water supplied to a perforated pipe near the bottom of the sludge compartment, the valve controlling it should be opened just before sludge is to be drawn.

There is danger of drawing too much sludge at one time. A certain amount of digested sludge should be left in the tank to seed the sludge compartment. Otherwise the process of sludge digestion will be temporarily retarded each time the sludge is drawn. No fixed rule for determining the proper amount of sludge to draw at one time can be given. It is the writer's

practice to close the sludge valve when the outflowing sludge begins to change from a black to a gray color. However, this rule probably will not be applicable to all tanks, and each operator must learn from experience when to stop drawing the sludge.

In addition to drawing sludge when the sludge compartment is nearly filled, it is often advisable to draw the sludge in small amounts when there is any evidence of "foaming" in the gas vents. The writer believes that it is better policy to draw small quantities of sludge frequently rather than large amounts at long intervals.

8. *Drying sludge.*—A well-drained sludge drying bed is a necessary accessory to an Imhoff tank. Sludge drawn from the tank is either pumped to, or flows by gravity to, the sludge bed. It is not advisable to cover the bed to a depth greater than 12 inches. In from ten days to two weeks after it is applied to the sludge bed (during fair weather) the sludge should dry enough to be easily removed with hoes and shovels. This should be done promptly, so that the bed may be ready for the next dose of sludge. In some cases the drawing of the sludge may be hastened by mixing a solution of alum with the sludge just before it enters the drying bed. Recent experience at Plainfield, N. J., where 1.35 pounds of alum per cubic yard of wet sludge was applied to the sludge, indicates that a considerable saving of sludge drying time can be effected. The method of applying the alum is very simple.

Operating Problems

The difficulties encountered in the operation of Imhoff tanks may be summarized as follows:

1. Occurrence of septic action in the sedimentation chamber, which results in a cloudy, odorous effluent
2. Clogging of slots, which prevents proper disposition of sludge
3. Clogging of sludge pipes
4. "Foaming" at the gas vents

In a well-designed Imhoff tank most of these difficulties arise as the result of inefficient operation and may be overcome by carefully following the operating procedure outlined above. In some instances, however, troubles are the result of faulty design. It may be that the designer has not fully understood the principles which control the operation of an Imhoff tank, but more often

trouble arises from the fact that the tank is called upon to do more work than the designer planned it to do. Whatever the reason for operating difficulties, it is surprising to see what can be accomplished by a careful, conscientious, and skilled operator.

Prevention of septic action in the sedimentation chamber, of clogging of slots and sludge pipes, may all be prevented by following the suggestions which have been made. When the sludge pipes do become clogged, however, there are different ways of getting them cleaned out. If water under pressure is available, a hose with attached nozzle may be dropped down the sludge pipe. A stream of water from the nozzle will frequently dislodge the obstruction. If this does not succeed, a soil augur attached to a shaft of sufficient length to reach the bottom of the sludge compartment should be tried. By twisting the augur and lifting it carefully, the obstruction may be removed. If an augur is not available, a hook will serve the same purpose. Usually the obstruction is formed by rags, and this fact should be kept in mind when attempting to clean out the sludge pipe. In some cases, however, the clogging is due to the solidification of sludge.

"Foaming" is an abnormal boiling in the gas vents. Under certain conditions gas seems to be produced in large quantities in the sludge compartment and rises so rapidly in the vent chambers, carrying finely divided sludge with it, that the scum on the vent chambers is lifted until overflow takes place. The causes of foaming seem to vary. Overloading of the plant, excessive accumulation of sludge, inadequate gas vent area, oil from garages, septic sewage, and wastes from creameries have all been charged with causing foaming conditions.

During the past summer the writer had some experience with foaming in an overloaded tank and has seen the gas vents boil over five times in one day in spite of thorough hosing of the gas vents. The sludge produced by the tank in question had a practically neutral reaction—it was neither acid nor alkaline to litmus. And yet the addition of hydrated lime to the tank every other day certainly decreased the foaming tendency, although it did not entirely eliminate it. The tank in question was designed in 1916 to treat the sewage

from a population of 2,000; the sludge compartment had a capacity of 2,500 cubic feet, or 1.25 cubic feet per capita. The tank is now receiving sewage from a population of 3,000—hence the overloading. Experience seems to indicate that a sludge capacity of 2 cubic feet per capita should be provided. The permanent remedy for an overloaded tank is obvious: additional tank capacity should be provided.

Drawing of sludge frequently and in small amounts will often correct foaming conditions. In some cases the installation of fine screens ahead of the Imhoff tank is efficacious. Such a procedure really amounts to reducing the load on the tank. Wastes which make the sewage acid, such as those

from creameries, should be treated separately. If for any reason they are temporarily present, lime should be added to neutralize them.

Conclusion

The operating difficulties which are met in operating an Imhoff tank can be very largely eliminated by following an operating schedule which calls for the performance of certain duties at regular intervals.

If difficulties arise which are not overcome by ordinary methods, it is advisable to consult an experienced sanitary engineer.

ACKNOWLEDGMENT.—From a paper read before the Conference on Sewage Treatment held at the Iowa State College under the auspices of the Engineering Extension Division.

Removing Ruts from Gravel Roads

EXPERIMENTS covering several months on a gravel road in southern Indiana have shown that it is possible to keep ruts or corrugations out of this type of road surface, according to A. K. Hinkle, Maintenance Superintendent, State Highway Commission of Indiana. The methods of overcoming these corrugations is simple and unique. In the main, it consists chiefly of crushing gravel and stone so that it will pass through a 1-inch screen, and applying the dust along with the screenings. With proper and systematic maintenance, dust will almost eliminate ruts, the most annoying features of gravel and stone road travel.

Corrugations are formed in gravel roads when traffic reaches a certain density, and are due to the vibration of the car combined with the slipping or "kick-back" of the drive wheel as it drops into the trough of the corrugations. Corrugation development is accelerated after a rain by water splashed out of the de-

pressions and carrying with it some gravel and sand. This accounts for the faster development of corrugations on flat grades. Corrugations develop faster in gravels lacking cement material and in those deficient in coarser pebbles. Gravels with an excess of fine silica sand of no cement value corrugate readily.

The corrugations in roads can be greatly reduced by the addition of a thin coat of crushed gravel passing a 1-inch opening and containing all the dust incident to crushing. Crushed limestone of the same grade can also be used in the same manner. Roads made of limestone and maintained by the dragging process, the same as gravel roads, corrugate much less than the average gravel road. This is due to the stone, which apparently has a greater cementing value. Stone roads not properly maintained are more inclined to develop pot-holes, instead of the rhythmic corrugations developed by gravel.

Building Permanent Culverts and Small Bridges

BECAUSE small bridges and culverts are the most permanent features of modern highway construction, with the possible exception of the location and grade work, William J. Titus, Bridge Engineer of the Highway Commission of Indiana, states that they should be built for permanence and to withstand the heavy truck usage of modern overland transportation.

One of the big problems of state road construction to-day is the thousands of small and weakly constructed bridges that are hazardous to increased traffic, which runs up to 20 tons per vehicle. Many of these bridges were designed when roads were single-track affairs, and have foundations too weak for the support of modern traffic. Under no conditions should new bridges be less than 18 to 20 feet

wide, and they should be able to support 20-ton traffic. If such a plan is adopted, it means a great saving to taxpayers everywhere, for when roads with these modern bridges become a part of the state highway system, the bridge problem is solved, and, after all, the people pay for the improvement, whether state, county or township builds it. Foundations are most important in bridge construction. The difficulty to-day is that many smaller county bridges have foundations in sand or on streambeds. When there is a question of doubt, foundations should always be on piling. The day of the tread board or "half-sole" floor of bridges is past, because motorized traffic cannot keep on this track and is shunted to either side, destroying the side walls of the bridge.

Does Pavement Maintenance Cost More Between Tracks Than Elsewhere?

By R. C. Cram

Engineer, Surface-Roadway, Brooklyn-Manhattan Transit Corporation

IN the recent conferences between municipal and railway engineers on the subject of track pavements, and in certain articles recently appearing in the technical press, there has been an insistence upon the part of municipal representatives that it costs more to maintain pavements in railroad streets than in non-railroad streets.

Certain data bearing upon such maintenance costs as obtaining in Brooklyn, N. Y., have been quite widely quoted, and G. W. Tillson makes the following statement of Brooklyn costs in *Engineers and Engineering*, published by the Engineer's Club of Philadelphia.

"During the years of 1913 to 1918 inclusive the cost of repairs to asphalt pavements in Brooklyn, N. Y., on car track streets in the areas outside of the railroad area, averaged \$0.039, while on streets without car tracks it was \$0.022 [per square yard]."

It has interested the writer to examine the records of the railroad companies in Brooklyn, with the view of determining what their costs for paving maintenance may have been as compared with the city costs just quoted. For a period of about 10 years the engineers of the companies have kept a careful record of the maintenance cost of tracks, and the following statistics are available:

The railroad companies maintain approximately 2,200,000 square yards of pavements of all kinds in the boroughs of Brooklyn and Queens. Of this total, 261,000 square yards are paved with asphalt, principally in the 2-foot strip adjacent to the outer rails, but with a considerable portion within the rails as well. The larger part of this asphalt area is adjacent to tracks whose average age is about 17 years and whose maximum age is 29 years.

But the principal pavements between the rails are block pavement, usually granite, with some wood block, Belgian and slag block, brick and even cobblestones. Approximately 1,500,000 square yards of these block pavements are on a concrete base.

During the years 1915 to 1918, the aver-

age annual cost for maintenance of these pavements for wear only (not including the repairs or repavement made following track work of any kind) was \$102,972.00, or \$0.047 per square yard yearly. This unit covers all kinds of track and pavement and compares very favorably with that quoted by Mr. Tillson for asphalt only, being but \$0.008 greater. Mr. Tillson's units are also subject to several interpretations. He notes a greater maintenance unit cost of \$0.017 per square yard for railroad streets than for non-railroad streets, but it will be seen that the railroad unit cost above given is nearly the same as the city cost for railroad streets. The railroad costs are principally for areas paved with block pavements, which are more costly to maintain than asphalt.

Meanwhile it should be borne in mind that railroad streets are generally important arteries and that a much greater pavement wear must be expected, not only on the railroad area, but also outside thereof, on such streets. It is by no means scientific simply to compare costs of maintenance of pavements on railroad streets with those for non-railroad streets without considering traffic, and Mr. Tillson himself has said that the figures he quoted prove nothing, but he believed they are indicative. They certainly are indicative of the probability that pavement maintenance on railroad streets is no more costly within than without the railroad areas, taken as a whole, and probably if taken in proportion to traffic carried, the annual maintenance may be less than that on non-railroad streets. The rails certainly have prevented a great deal of wear by relieving the pavement through transference of a large part of the loads to the rails.

In 116 miles of the more modern track, built in Brooklyn since 1907, for which we have a very good record of paving maintenance costs covering tracks varying in age from 1 to 12 years and having an average age of 5 years, taking the average of the

expenditures for the years 1915 to 1918 inclusive, we find unit expense of \$0.031 per square yard per year for the 4 years covered. This unit is slightly less than the city area unit of \$0.039.

Again we find, to bring in the influence of the high costs of all items since 1917, down to January 1, 1923, that the pavement in 160 miles of track varying in age from 1 to 16 years and having an average age of 8 years, has a unit expense of \$0.041 per

square yard per year. This unit will be seen to compare most favorably with the city area unit of \$0.039 for the period from 1913 to 1918, which was practically uninfluenced by war-time costs and by the post-war costs which have prevailed since 1918.

ACKNOWLEDGMENT.—From a paper read before the Governmental Research Conference, Washington, D. C., November 16, 1923, under the auspices of the National Municipal League. See article by the same author in *THE AMERICAN CITY*, January, 1924, pages 26-28.

Small-City Park Development Through Community Cooperation

By H. E. Inlow

Chairman, Park Committee City Planning Commission, Pendleton, Ore.

THROUGH cooperation of various civic agencies, a comprehensive plan for the development of parks and for general civic beautification is now being effected in the city of Pendleton, Ore. When carried to completion the plan will provide this progressive western city with one of the best systems of parks and playgrounds to be found in any community of its size and will stand as a lasting monument to the spirit of cooperation and community enterprise which exists there.

The City Planning Commission, created under state law some two years ago, has since its organization been conducting a study, with the aid of experts, of the needs,

possibilities of improvement and desirable features and types of improvement for the community. These plans having progressed to the point where they were ready to be consummated, the question of financial and cooperative aid has this year found a happy solution. The Pendleton Round-Up Association, which since 1910 has presented an increasingly famous and popular frontier exhibition and whose officers and members each year give largely of their time and effort to this enterprise without salary or other compensation except the gratification which arises from viewing a work well done and appreciated, found itself this year with a balance of more than \$10,000 on its books.



AIRPLANE VIEW OF THE ROUND-UP IN PENDLETON, ORE.

Forward Steps in Municipal Affairs

How Youngstown Secured Its Unique Branch Library

YOUNGSTOWN, OHIO.—The new branch library erected on the Public Square in the heart of the city of Youngstown is unique not only in its unusual location, but in the fact that the materials and labor for its construction were donated by local labor unions, material-men, manufacturers and other public-spirited citizens.

The location of the main Public Library at some distance from the business center of the city has made it difficult in the past for the working people to take full advantage of the supply of books available for distribution. The first definite steps to remedy this difficulty were taken last summer, when the library authorities took up the question of installing a circulating branch of the main library on an available plot in the Public Square. It was decided at that time to suggest that the various local building trades unions donate the labor for the erection of the building. The willing response on the part of the labor unions to this proposal, and the gifts of

building materials and furnishings, as well as cash donations which were soon received, gave evidence of the fact that the people of Youngstown have a real appreciation of the service rendered by the Public Library. Actual construction work was begun early in October last, and in two months from that time the library was opened to the public. The building as it now stands is an example of fine workmanship in every detail, and is a distinct credit to all those who took part in its erection. One of its interesting features is that it stands on a steel base. This will make it possible for the library to be transferred to another location at some time in the future, should changes in business and traffic conditions make it advisable to do so.

This new branch library accommodates approximately 5,000 volumes, the majority of which are on business and technical subjects. Fiction service is not neglected, however, and in addition to a good assortment of new books, attractive editions of the standard classics have been supplied. The use of this library is limited to persons



BRANCH LIBRARY ON THE PUBLIC SQUARE IN YOUNGSTOWN, OHIO



SILVER CUPS AWARDED IN THE VILLAGE IMPROVEMENT CONTEST IN CLARINDA, IOWA
The one in the center was awarded for the home having the highest grade in the entire city, which also won the special cup for Stuart Street

over eighteen years of age, or others who are employed and are no longer attending school.

Making an Attractive Village More Beautiful

CLARINDA, IOWA.—Early in the spring of 1923, members of the Clarinda Community Club became interested in the idea of making their already attractive little community more beautiful. A small committee was chosen from the club's four hundred members to develop a plan. This resulted in the staging of a contest with prizes for the greatest improvements in the appearance of homes and gardens during the summer.

The town was divided into nine districts, each assigned to a committee of the Community Club, whose first duty was to make a canvass of the residents to secure their enrollment in the competition. The announcement of the contest was received with a great deal of enthusiasm, and nearly four hundred residents signified their willingness to participate. Throughout the summer, the homes of the competitors were visited by members of the committees, and each home was graded according to the improvements effected on the house and other buildings, lawns, gardens, etc. At the close of the summer, averages were taken on the gradings, and a first prize of a sterling silver cup and a second prize of \$5 were awarded to those in each district having attained the highest grades. The large cup in the center of the accompanying picture was presented to the owner of the home

having the highest grade in the entire city. In addition to these prizes offered by the Community Club, the winning home on Stuart Street was awarded a special cup donated by Mrs. C. W. Stuart, for whose husband that street had been named. Mr. and Mrs. Virgil McCreary were the winners of this cup and also of the grand prize for the city.

The contest was so well arranged, and the prizes in each case so manifestly earned, that there seemed to be no dissatisfaction as to the choices made by the judges. Such splendid results were accomplished by the event last year, that the Community Club expects to repeat the plan during the coming spring and summer.

(MRS.) ORA CLAYTOR MOORE.

How a Small City Is Reducing Its Insurance Rates

LAFAYETTE, LA.—Through the combined efforts of the insurance agents of Lafayette and the Chamber of Commerce-Community Service of Lafayette Parish, as our local commercial organization is known, the people of this community will enjoy the benefits of lower fire insurance rates in the very near future. The movement to bring about this rate reduction was started a short time ago when representatives of several local insurance agencies, together with members of a special committee from the Chamber of Commerce, appeared before the Board of Trustees of Lafayette and presented recent data received from the Louisiana Fire Prevention Bureau relative

to the city's standing in the matter of fire protection and prevention. Following this meeting, the Fire Prevention Bureau was asked to arrange for a complete survey of the city, with a view to establishing a new insurance rating.

In the inspection which subsequently was made by the Municipal Engineer of the Fire Prevention Bureau, tests were made of the fire plugs, fire-alarm boxes, wells and reservoirs, pumps, fire engines, etc., and a detailed report was submitted to the City Council. In this report it was pointed out that a general reduction in the basic fire insurance rates is now applicable in Lafayette owing to the number of improvements which have recently been effected. These improvements include the erection of a new pumping-station, with well pump and booster; increased total stand-pipe and reservoir capacity; new fire station; addition of two regular firemen and two

a later date, if the additional improvements suggested in the Bureau's report are accomplished, a further reduction will be applied for.

I. T. HART,
Insurance Agent.

A Gift of a Playground

FORT WAYNE, IND.—Through the generosity and public spirit of Mr. and Mrs. S. F. Bowser, their fellow residents and the children of Bowserville have been provided with a permanent park and playground. The site, which covers one-half of a city block, was bought by Mr. and Mrs. Bowser and then deeded to the city of Fort



WADING POOL AND
PART OF THE PLAY-
GROUND EQUIP-
MENT IN BOWSER-
VILLE PLAY-
GROUND, FORT
WAYNE, IND.

men for night duty, all on a paid full-time basis; additional hydrants and water-main extensions; and completed construction of all paved and graveled streets. It was further pointed out in the report that by making other specific improvements, a still greater reduction in the insurance rates might be secured.

At a joint meeting of the City Council, Chamber of Commerce and insurance agents, it was decided that the City Council should accept the reduction offered by the State Fire Prevention Bureau, and at

Wayne for public recreation purposes. The playground is well-equipped with swings, slides and other types of apparatus purchased by the city from The Hill-Standard Company, and was opened to the public under the supervision of the Fort Wayne Park Board in July, 1923. A fine wading pool was also installed, which helped to make the playground one of the most attractive and popular resorts for the children of the neighborhood during the past summer.

ADOLPH JAENICKE,
City Park Superintendent and Forester.

The Water-Works of Greenville, Miss., Put on a Paying Basis

By E. M. Foster

Water Superintendent, Greenville, Miss.

IN 1896, when the plant in Greenville was first constructed, the equipment comprised two boilers, two steam-driven air compressors, two ½-million-gallon steam booster pumps and surface reservoirs. The common method at that time for securing water from wells was by the air-lift system. The air compressors pumped the water from the wells to the reservoirs and the booster pumps from the reservoirs to the mains. By 1905, the water demand had increased so rapidly that the plant did not have sufficient capacity, and it was necessary to install a cross - compound air compressor, and a 3 - million - gallon triplex booster pump in the plant.

In 1915 the local power company, on the lookout for new customers, proposed that the city electrify the pumping plant. Their purpose, of course, was to obtain a desirable power load for their electric lines and incidentally effect a saving to the city. A counter proposal, the essence of which was that the power company operate the water plant on a flat rate, was advanced by the city. On this basis a six-year contract was made between the city and the power company.

The first step was to electrify the pumping plant; two motor-driven air compressors and three motor-driven high-speed centrifugal pumps replaced the steam equipment. Steam pressure was maintained in the boilers at all times, however, and the steam units were kept in readiness for use in case of failure of the electrical power.

The new electrically driven equipment was installed to give the very highest efficiency possible, but even with these precautions the power company had anything but a lucrative proposition. By 1920 the operating cost and excess water demand, due to leaks in the mains, and unmetered service, were so high that the water-works proved to be a losing proposition. In 1921, when the contract terminated, the power company refused to re-

new it; this of course reverted the water-works to the city.

E. M. Foster, then chief engineer of the Delta Light & Traction Company, was employed by the city to take charge of the water-works. He realized that if the power company could not operate the plant at a profit, the city could not do so unless some improvements were made.

How It Was Done

When Greenville, Miss., assumed municipal control of the water plant on January 1, 1921, the yearly operating cost was approximately \$52,000; to-day it is \$20,000.

Although there is nothing miraculous about this saving, it does show the result of a careful study of all phases of the water system. The causes of inefficiency were ferreted out and efficient methods were applied soon after the city assumed control. The three remedies which have been responsible for practically the entire saving were: (1) the installation of water-meters; (2) stopping leaks; and (3) the change from the air-lift system to the Layne system using vertical centrifugal pumps.

Checking Water Waste

A Venturi meter which measured the amount of water going into the main was recording, on the average, 3 million gallons a day. It was evident that a town of 11,000 inhabitants and a few industrial plants could not consume this amount. Inspectors were employed whose duty it was to make systematic inspection of the private plumbing, and if a leak were found, the consumer was notified to repair the plumbing, or service would be discontinued; all noticeable leaks in the mains were immediately repaired. In a few months the daily consumption was less than two million gallons. The main pressure, which had been



EQUIPMENT USED IN WATER-WORKS PUMPING-STATION, GREENVILLE, MISS., PRIOR TO 1921

maintained at 60 pounds, was reduced to 50 pounds and later to 40 pounds without complaint from the consumers. This decreased the amount of water pumped to 1,600,000 gallons. The water had always been sold on a flat rate based on the number of fixtures, but the installation of meters, first on the large consumers' taps, and then on the others, has made our present daily requirements approximately 1,150,000 gallons. To date 1,000 meters have been installed. About 45 per cent of the customers are metered; the others are being metered as rapidly as possible and in a short time the consumption will be less than 1,000,000 gallons a day, a reduction of 66 per cent in less than three years.

Reducing Pumping Costs

The water required had now been reduced to a minimum, and the next move was to find a more efficient method of pumping the water. The air compressor equipment had been installed and maintained as efficiently as possible, but nevertheless it was a very expensive proposition. Our new investigation included plunger pumps, air-lift, and deep-well centrifugal pumps, and we decided upon the latter, because of the high efficiency and low maintenance cost inherent in equipment of this type. A contract was made with Layne & Bowler Company of Memphis, Tenn., to furnish two high-efficiency

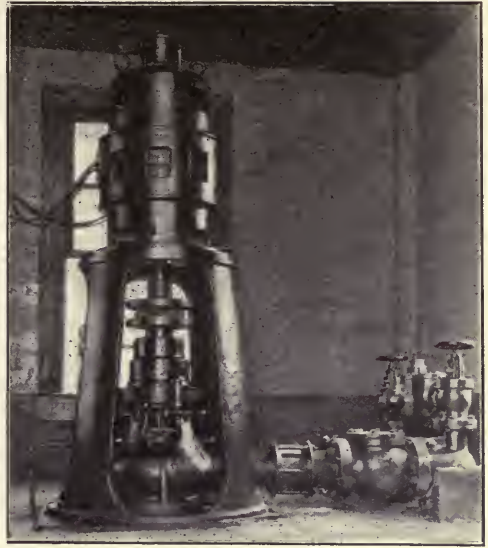
pumps and two wells and to guarantee the quantity of water to be delivered; that is, for the price stipulated in the contract, the first unit had to produce 1,200 gallons per minute and the second unit 900 gallons per minute, or the money would be refunded. One unit was installed at the pumping plant, and the second unit in the approximate center of the water distribution system. The official test showed 1,500 gallons per minute and 1,200 gallons per minute respectively. These units pumped directly from the wells to the mains against 40 pounds pressure; in other words, the two operations of pumping from the wells to the reservoirs and then to the mains were combined into one. One pump, housed in a frame structure, now does the same work formerly done by the extensive earlier equipment.

The motor frame supporting the vertical 100-h.p., 870-r.p.m. Westinghouse motor rests on a concrete foundation, and the pump impellers and stages are set 80 feet below in the wells. A vertical shaft enclosed in an oil tubing connects the impellers and the motor. The wells were drilled to a depth of 525 feet. To accommodate the pump, a 24-inch hole extended down 82 feet; beyond this the hole is 10 inches in diameter with a special wire wrapped screen placed opposite the water-bearing formation. Before a screen of a definite opening was decided upon, the sample of sand was

analyzed to determine the correct screen size, sufficiently small to restrain the sand but large enough to admit the water freely. This screen is made by winding keystone shaped wire on a perforated iron pipe so that the smaller width of the wire is wound next to the pipe. The pipe gives strength to the screen and does not allow it to be distorted by external pressure. The openings on the outer circumference of the screen are considerably smaller than the openings on the inside, so that the sand does not clog the screen; any sand that passes through the outside will go immediately into the well and not impede the flow of water.

The new equipment was put into service in July, 1921. An immediate result was shown in our power bill: in June, 1921, the electrical consumption was 74,010 kw. hrs. and in September, 1921, 53,820 kw. hrs.

The Layne pumps had been designed to pump 1,300 gallons per minute against a 50-pound pressure, and at that rating had an efficiency of 70 per cent, but as the water demand decreased, a gate-valve was necessary to throttle the discharge and keep a 40-pound pressure at the mains. A hand gate-valve proved very unsatisfactory, and an automatic regulating valve was installed between the pump discharge and the main, which maintained a 40-pound pressure at



VERTICAL DEEP-WELL PUMP AT GREENVILLE

all times, regardless of the pump pressure. The pump pressure was always 20 to 60 pounds higher than the main pressure. To increase the efficiency of the installation, one of the stages of the vertical pump was removed. While this was being done the water system was operated for six days by air. In the six days of air pumping, the kw. hr. consumption of the air-lift was 12,-

820. The following six days the meter readings on the Layne system showed 7,994 kw. hrs., or a saving in six days of 4,826 kw. hrs. From this test the comparative data on page 270 have been prepared, based on a power cost of 2½ cents per kw. hr.

The estimated saving in one year, that is, \$7,250, would be the interest on an investment of \$120,500 at 6 per cent. The repairs since 1921 on the Layne unit have been practically negligible. New packing is put in about every 90 days, and this is really the only expense connected with the equipment.

The Greenville water-



LAYNE PUMP-HOUSE AND AUTOMATIC REGULATING VALVE, GREENVILLE

works to-day is in a better condition than ever before; the building and yard—a deplorable spectacle a few years ago—are now very presentable; the water consumption is now 1,150,000 gallons per day, and the pumping cost has been reduced approximately 50 per cent.

	Daily Kw. Hr.	Gallons per Day	Kw. per 1,000 Gal.	Cost per 1,000 Gal.	Yearly Cost
Air-lift	2,137	1,150,000	1.86	4.18	\$17,600
Layne system ..	1,332	1,150,000	1.10	2.47	10,350
					<u>*\$7,250</u>

* Yearly saving.

When the two units were first installed, it was necessary to operate both of them at times in order to supply the water demand. Since the requirements have been decreased, only one centrifugal unit is used and the other is held in reserve. We believe that by the installation of an elevated tank which we are contemplating, for the future we can reduce our power consumption another 25 per cent, as the one well that we use regularly will give enough water at full capacity in thirteen hours to supply our city for twenty-four hours.

Madison's Streets Cost \$418,114 in 1923

By E. E. Parker

City Engineer, Madison, Wis.

STREET improvements made in Madison, Wis., during 1923, aggregating \$418,114.36, were accepted by the Common Council during 1923. Contracts awarded for new street pavements for 1923 represented a total cost of \$392,421.12. A number of streets were not completed, but several pavements for which contracts were awarded in 1922 were accepted during 1923. Of the streets accepted, the cost was divided as follows: city's share, \$118,606.52; property owners' share, \$284,623.81; Madison Street Railway Company's share, \$14,387.03; Chicago and Northwestern Railway Company's share, \$497.

During 1923, 6.26 miles of pavement were laid, bringing the total number of miles of improved streets up to 89.4. Various kinds of pavements and the number of miles of each are: plain macadam, 33.42; tar-filled macadam (penetration), 1.53; Tarvia concrete (Topeka mix), 0.01; asphalt-filled macadam (penetration), 6.80; asphalt-mixed macadam, 5.06; asphaltic concrete, 2.63; sheet asphalt, 19.31; brick, 1.56; sandstone block, 0.10; cresoted wood block, 2.90; concrete (reinforced), 15.18.

During the year 1.15 miles of sheet asphalt paving was laid, 1.47 miles of wood block and 3.64 miles of concrete.

The Cost of Maintaining Sewers

IN 1922 the Bureau of Sewers of Chicago, Ill., spent \$365,733.31 for cleaning sewers, \$118,039.59 for repairing sewers, \$64,353.29 for inspection, \$36,067.39 for office and miscellaneous expenses, and \$27,501 for the replacement of three Auto Eductors. There are now in service in Chicago 760.79 miles of brick and concrete sewers, 1,868.81 miles of tile pipe sewers, 132,088 catch-basins, 98,372 manholes, and 421,086 house drains, a system which represents a total cost of \$44,553,376.11 for

sewers and auxiliary equipment.

For flushing 8,486,300 lineal feet of sewers the cost was \$59,598.28, or 70 cents per 100 feet. The cost for cleaning by scraping a total 747,500 lineal feet of sewers was \$90,538.58, or \$12.10 per 100 feet.

Hand cleaning of 19,860 catch-basins cost \$70,945.32, or \$3.58 per catch-basin. For cleaning 20,092 catch-basins with Auto Eductor machines, the cost was \$63,729.17, or \$2.19 per catch-basin.

Facts Regarding the Municipal Power-Plant at Pasadena, Calif.

THE electrical utilities of the city of Pasadena, Calif., showed a gross income of \$823,803.95 for the fiscal year ended June 30, 1923, which was an increase of 18.09 per cent over the previous year. The output in kilowatt-hours sold increased 6.9 per cent. After paying all operating expenses, including depreciation and charging interest on the total average investment, there was carried to surplus for the year \$204,675.37, making the total amount carried to surplus to date for this utility, \$890,-

925.56. The investment per dollar gross receipts during the past year was \$1.77, as compared with approximately \$5 or more for well-managed privately owned electric light and power utilities. The income per capita was \$14.03, which is a very good showing indeed considering the low rates charged by the city. The rate charged by this utility for light ranges from 5 cents to 3 cents per kilowatt-hour and for power from 4 cents to 1½ cents per kilowatt-hour.

Outstanding Problems in Highway Bridge Design--Part II

By E. F. Kelley

Senior Highway Bridge Engineer, U. S. Bureau of Public Roads

Bridge Floors

FLOORS of concrete bridges will, of course, be of concrete. Floors for steel bridges may be of either wood or concrete. The determination of which material shall be used depends upon first cost and maintenance charges. The use of a wood floor will usually result in a somewhat lower first cost, both in the floor itself and, because of its low weight, in the supporting structure. But the maintenance cost is high, both on account of decay and on account of traffic wear. Decay may be partially overcome by preservative treatment, and protection from the wear of traffic may be afforded by some sort of wearing surface. Both preservative treatment and wearing surface are expensive and tend to eliminate much of the apparent advantage in first cost.

We have many thousands of wood-floored steel bridges which are still serviceable but which are too light to carry anything but the wood floors for which they were designed. Increased traffic has made the maintenance of these floors very expensive and they must be maintained if the bridges are to be continued in service. A very satisfactory method of handling this maintenance problem is the use of laminated or strip floors of 2 by 4's or 2 by 6's laid on edge and spiked together, and protected from wear by a carpet coat of tar or asphalt mixed with gravel or stone chips. This provides a serviceable floor and one which increases the rigidity of light structures. But this situation should be avoided in future construction by making fixed steel bridges capable of carrying a concrete floor, even though it is intended to construct



ACCIDENTS LIKE THIS ARE OF TOO COMMON OCCURRENCE
A right-angle turn in the bridge approach and a flimsy rail contributed to this accident

them in the first place with wood floors.

Wearing Surfaces

The bridge floor has two distinct functions to perform—it must be capable of carrying traffic loads and of resisting traffic wear. It is not desirable to subject to wear that portion of the floor upon which we depend for structural strength and, therefore, concrete bridge floors should be protected by a wearing surface or pavement. It will then be necessary to construct the floor only once—when the bridge is built. The pavement, which is subject to the destructive effect of traffic, can be maintained and renewed as required.

Concrete wearing surfaces for bridge floors are of two types—those placed monolithically with the concrete sub-floor, and those placed separately. The separately placed wearing surfaces are to be preferred, since they furnish a definite line of demarcation between the wearing surface and the sub-floor and thus provide effectively for maintenance and renewal.

In general, it is desirable that the bridge pavement be of the same type as the pavement of the adjacent highway. Of the



A TYPICAL STEEL COUNTRY HIGHWAY BRIDGE

This bridge of the old type with its dangerous unprotected approach and trusses which are exposed to possible injury by vehicles, should be replaced by a structure more in accordance with the safety of traffic

wearing surfaces other than concrete, brick and asphaltic concrete find their greatest use when the highway paving is of one of these materials. Asphalt blocks are well suited for floors upon which an asphalt surface is desired but where the size of the job is not sufficient to warrant the purchase or use of even a moderate-sized paving plant.

In case a bridge is located on an unpaved road upon which traffic is not sufficiently heavy at the time of construction to make a wearing surface of immediate necessity, the pavement may be omitted temporarily and placed later, when needed for protection or when the highway is paved. In the latter case it may be included in the regular paving program. In all such cases it is desirable that some additional thickness of floor be provided as a temporary monolithic wearing surface and it is essential that provision be made in design for the weight of the future pavement. The proper allowance to be made for the weight of future paving will depend, of course, on the type which is anticipated. It should never be less than 25 pounds per square foot, which will permit the use of a 2-inch bituminous surfacing, and if concrete or brick is to be used it should be at least 50 pounds per square foot.

For bridge pavements the requirements governing quality of materials, care in construction and curing, and accuracy of finish should be, in all respects, at least equal to the corresponding requirements for the highway pavement, of which the bridge floor is virtually a part.

Junction of Bridge with Highway

Theoretically, the junction of the bridge floor with the adjacent highway should be smooth and even and should have as good riding qualities as any other portion of the road. Actually, this condition is difficult of attainment because of the settlement of approach fills and the necessity of providing expansion joints at the ends of structures. The design of expansion joints which will perform their function without introducing ob-

jectionable features in the roadway surface is a difficult matter. Innumerable types of joints have been used, but the ideal joint is yet to be devised.

The settlement of approach fills introduces a complication which is particularly difficult to overcome on unsurfaced roads or those surfaced with a non-rigid type of pavement. In these cases only the most careful maintenance will prevent objectionable and dangerous humps at the ends of bridge structures. When the highway paving is of concrete, the difficulty has been overcome in many instances by bridging, with the pavement itself, that portion of the fill adjacent to the structure. The end of the pavement is supported on the abutment back-wall and is reinforced to act as a slab for a distance of from 10 to 20 feet from the abutment. If appreciable settlement does occur when this construction is used, it will not result in a dangerous hump.

In some instances, serious damage has been done to bridge structures by the creeping of concrete pavements. When this action takes place, there are introduced forces of greater magnitude than any bridge can be expected to withstand. To provide for this condition, diagonal expansion joints have been placed in pavements near bridges, with the idea that any longitudinal movement of the pavement will force it to move transversely along these joints and thus prevent the enormous pressure from being transferred to the bridge. I do not know that any such installations have been in place long enough to demonstrate their effectiveness.

Protection of Structures and Traffic

Before the advent of high-speed motor traffic it was considered sufficient to provide for the safety of vehicles on structures. Now we must not only make this provision but must also protect our structures, particularly our truss spans, from traffic accidents.

It is only recently that the need for this protection has become apparent, but now our bridges are being wrecked in ever-increasing numbers, with consequent loss of life and property. Trusses are the most vulnerable and have been the chief victims of these accidents. Their adequate protection from injury or total destruction is a new problem for highway bridge engineers, and a most important one.

The accidents which have occurred indicate that the structure must be afforded protection for its entire length, since spans have been wrecked by collisions with web members as well as with end posts. Two methods have been suggested as a means of affording this protection. The first of these is the use of skid beams such as are used on railway bridges; the second is the construction of curbs high enough to stop a truck. Both methods have their disadvantages. One is that neither is very well adapted to use on existing structures. Another is that both will probably detract from the appearance of the structure.

The two principal requisites of any protection which may be furnished are, that it shall be supported independently of the truss members which it is to protect, and that it shall be strong enough to stop a motor vehicle.

Of the two methods which have been suggested, it seems that protection by curbs offers the greater possibility of satisfactory development. But it is scarcely applicable to bridges not floored with concrete and can probably have little use on existing structures, since it will usually result in a narrowing of the roadway unless provision for this detail has been made in the original design. The curb should be at least 15 inches and preferably should be not less than

The bridge is an integral part of the highway. It must be capable of carrying the loads to which it may be subjected; it should restrict traffic as little as possible; its floor should have as good riding qualities as any other portion of the highway; it must afford safety to traffic and must itself be protected from accident.

18 inches high. Its inside face should be at least 12 inches from the clearance line of the truss members. By flaring these curbs at the ends of the structure and extending them out onto the approach fill or pavement, the end posts may be protected from vehicles approaching the bridge.

In the case of existing structures, when it is not feasible to protect the web system, the ends of the bridge may be protected from approaching vehicles by massive masonry posts.

In addition to affording positive mechanical protection, any device which may serve to direct traffic and to clearly define the roadway and the traffic lanes will be of benefit. Marking traffic lanes by painted lines on the roadway surface and painting railings a light color are effective.

From the humanitarian standpoint, the protection of traffic is more important than the protection of structures, and we have altogether too many serious accidents due to the lack of this protection. Traffic protection is not so simple as it was in the days of light vehicles and low speeds, and it is necessary to provide more adequate safeguards than have been furnished in the past. The protection of the bridge approach has already been mentioned. On truss bridges any adequate protection of the structure itself will safeguard traffic. On other bridges, particularly those of the deck type, substantial curbs and rails are necessary. Flimsy rails, which will not withstand great punishment before failure, have no place on modern bridges.

ACKNOWLEDGMENT.—From a paper read before the American Road Builders' Association, Chicago, January, 1924.

A Fly-Rhyme for Fly-Time

The time is nigh to swat the fly;
This annual pest gives none a rest;
Soak him early, soak him late—
That's what health officials state.

—*New York Evening Post.*



A STREET THAT WAS LITERALLY PULLED OUT OF THE MUD

South Chestnut Street, Clarksburg, W. Va., before and after improvement with reinforced concrete paving and curb

Modernizing a West Virginia City

By Charles F. Mebus

Albright and Mebus, Consulting Engineers, Philadelphia, Pa.

CLARKSBURG, W. Va., the county-seat of Harrison County, lies on the watersheds of the West Fork River and Elk Creek. The former runs from south to north, and the latter meanders through the city from east to west in a serpentine fashion to such an extent that the main street, running also from east to west, crosses the creek four times. There are twelve street bridges within the city limits—two over the West Fork and ten over Elk Creek. The city is built on more than the proverbial “seven hills,” and street grades run as high as 23 per cent.

The old city grew between the railroad and the hills to the south, and four additional villages grew to the east, north, west, and southwest, all of which were consolidated in 1917 into one city of about 30,000 population. At the same time a new scheme of city government was effected, namely a city commission consisting of the mayor and two commissioners. At the time of the consolidation most of the street improvements in the old city had outlived their usefulness, and public agitation for improvements resulted in a vote in 1919 authorizing a \$900,000 bond issue—\$300,000 for water, \$75,000 for fire protection, \$525,000 for bridges, sewers and paving. The terms of the bond issue provided that the program for city improvements and expenditure of funds should be made by a joint committee composed of the city commissioners and four citizens—the presidents of the four leading banks, later known as the “Bankers’ Committee.”

The first thing that engaged the attention of the joint committee was the selection of an engineering organization to plan and supervise the improvements. Owing to the fact that the City Engineer had but a small force and that the contemplated improvements involved radical changes in lines and grades of streets and approaches to bridges, which might subject a local man to much criticism and possible charges of favoritism by those adversely affected, it was thought best to engage an outside engineer with a separate organization to take charge of design and construction, working directly under the joint committee and in conjunction with the City Engineer. The committee engaged Charles F. Mebus for a period of three years as consulting engineer to direct the improvements; and inasmuch as the program originally outlined, together with many subsequent additions, could not be completed within three years, the same arrangement has by mutual consent of the city and the consulting engineer been continued into the fifth year.

Bridges

Five old steel bridges with plank floors were replaced by modern reinforced concrete structures. Three of these were on main streets, and of such a width as to allow but one vehicle and one street car to pass each other. All these were rebuilt at a higher elevation, with cartways as wide as those of the streets going over the bridges, with ample sidewalks on each side and with new approaches. The paving of

the cartways was the same as on the street approaches. Altogether, more than \$260,000 has been spent on bridges and new approaches.

Sewers

Like most cities in the United States, Clarksburg just grew. In the absence of state regulations, house drainage was conducted to the nearest watercourse in vitrified pipes, which were laid from time to time by property owners and by the city rather indiscriminately along the streets or through private property, as was found most convenient, or along lines that would require the smallest outlay of money. Surface water drainage was attempted in but few cases. In advance of street paving, which was so badly needed, it was necessary to plan and construct surface water sewers, and to revamp the sanitary sewer system; in fact, this system was practically reconstructed through the business section, as the new business buildings required sewers of larger sizes and laid at greater depths than those laid heretofore. Although the older sewers were seldom laid on the separate plan, the new sewers were so planned, when connected with old ones, that ultimately a separation of roof and surface water from house sewage can be made. The two gas companies also laid as a rule new lines and house connections. The Water Board did the same, and the Street Railway Company laid entirely new tracks on steel ties imbedded in a concrete base. All this work retarded the paving program, kept the streets torn up for a long time, and inconvenienced adjoining property owners and the people generally, but nearly all were more or less patient. Sewers were laid of vitrified pipe for sizes 24-inch and

under, for over 24 inches in diameter, of vitrified segment block in concrete cradle. A large part of the smaller sizes were also laid in cradle.

Paving

New curbing, often to new lines and grades, was laid in advance of paving. All curbing was of concrete 1:2:4 mixture, 8 inches on top, 10 inches at base, 20 inches deep, and with galvanized curb bars on the outside edge through the business section. Plain curbing was laid through residence sections, sizes 6 inches top, 8 inches base, 10 inches deep. At street intersections, to facilitate the movement of motor traffic, curbing was laid with large radii, 10 to 15 feet and over, as circumstances would permit.

Street paving was laid of two kinds—vitrified shale brick and reinforced concrete. Vertical fiber brick, 3 inches in thickness, was used on all bricked streets, except on grades above 8 per cent, where Hillside block was used, which also was 3 inches in thickness. The base for all brick paving was of concrete 1:2½:5 mixture, 6 inches in thickness, except over deep and wide trenches, where it was laid 8 inches in thickness. On top of the concrete a "dry cement sand" cushion, 1 inch in thickness, was spread, and the brick laid on it. Asphalt filler was used on all streets, except on a few steep hills, and has been found most satisfactory. Asphalt-filled joints allow the street to be opened to traffic at once and prevent cracks from forming in the brick paving. Repairs can be more easily made with asphalt-filled joints than with cement joints.

Concrete street paving was done only in minor residence streets where low cost was essential, as the cost of all the street pav-



ANOTHER BRIDGE ON MAIN STREET, SHOWING WIDENING OF THE STREET MADE POSSIBLE BY THE REMOVAL OF THE STEEL STRUCTURE



LOOKING WEST ON MAIN STREET, CLARKSBURG, W. VA., BEFORE AND AFTER THE REMOVAL OF THE BRIDGE OVER ELK CREEK, AND SHOWING THE NEW BRICK PAVING

ing and most of the sewer construction was assessed on the front-foot basis on the adjoining properties. The paving mixture was 1:2:3, thickness 6 inches at side, 8 inches at center; 56-pound galvanized iron mesh was used for reinforcing, and joints were filled with bituminous filler. On some grades above 17 per cent the surface was finished with grooves running partly across the driven part of the cartway.

Extent of Improvements

In the four years the following amount of work was done:

8-inch vitrified pipe sewer laid.....	Miles	1.8
10-inch vitrified pipe sewer laid.....	0.8	
12-inch vitrified pipe sewer laid.....	1.1	
15-inch vitrified pipe sewer laid.....	0.4	
18-inch vitrified pipe sewer laid.....	0.6	
20-inch vitrified pipe sewer laid.....	0.3	
24-inch vitrified pipe sewer laid.....	0.5	
30-inch vitrified segment block laid.....	0.1	
33-inch vitrified segment block laid.....	0.2	
42-inch vitrified segment block laid.....	0.1	
Total	5.9	
Sewer manholes built	142	
Sewer inlets built	137	
6-inch concrete curbing laid.....	Miles	11.4
8-inch concrete curbing laid.....	1.7	
Brick paving laid.....	Sq. Yd.	53,700
Reinforced concrete paving.....	45,500	
Houses moved back to widen or relocate streets	3	
Floors of stores raised	2	

The total cost of improvements made for four years was about \$1,100,000.

Traffic Regulations

An agreement was effected with the street railway company to lay additional tracks between the two main streets running east and west, in order to make it possible to establish one-way streets in the business section, which had heretofore been greatly congested. The Police Department, after the main streets were paved, adopted the one-way traffic regulations, which have

greatly facilitated the movement of motors through the business section, and through this regulation additional space for parking has also been provided.

Changes in Business Section

The business section of the city was also much improved by removing all trees from sidewalks and all awnings supported by posts on the curb line. A number of the merchants substituted marquees over store entrances. All wooden poles carrying trolley, telephone and light wires were removed and replaced by iron poles carrying wires on top and having ornamental brackets for street lights on the side. Many owners re-laid the sidewalks in front of their properties, thus making an entirely new street between property lines.

In promoting these changes the city authorities were well supported by the Chamber of Commerce and other local civic associations, as well as by the public utilities companies. On the whole, most excellent team-work was secured from all parties concerned.

Financing

The total fund provided by the bond issue was but \$525,000, of which about \$250,000 was required for bridge construction and \$165,000 for sewer construction the first year. It was intended to use the balance as a "revolving fund," that is, to allow the bond issue to run, and apply payments received from assessments to new paving over and over again until the paving program was completed. During the second year, however, the Attorney General ruled that all money received from property owners for assessments must go into the sinking fund for redeeming the bond issue. The State

Legislature in 1921 granted the city a new and up-to-date charter by which the city was authorized to carry out the street paving and sewer program with funds obtained from front-foot assessments.

Council-Manager Government

The new charter also changed the form of city government from city commissioners, as above noted, to council-city manager. Clarksburg was fortunate under the new charter to obtain the services of a city manager who had had experience in other cities. The powers granted by the new charter and the progressiveness of the Council and City Manager enabled the city to go on with its program for improvements without interruption. Altogether, over \$1,100,000 worth of work has been done in the last four years, and the city's indebtedness has been reduced at the same time.

The progressive spirit of the citizens may be judged from the fact that when it was learned that about \$60,000 was necessary to build approaches to the proposed new crossing under the main line of the Baltimore & Ohio Railroad on the line of the old Northwestern Pike, an amount which

could not be obtained from assessments on adjoining property, an extra tax levy of one mill was promptly authorized by a popular vote. This work is now in progress and will be paid for in cash. Again, since the people saw the improvements in the center of the city, numerous petitions have been filed with the City Council for paving streets and laying sewers in the residence section entirely at the expense of the adjoining properties.

What has been done here merely goes to show that the American people can have almost anything in the way of municipal service and improvements for which they are willing to pay; and, conversely, that the American people are very likely to be willing to pay for almost any needed and worthwhile municipal improvement, provided it is intelligently planned and honestly installed.

H. G. Otis is the City Manager, Thomas Lang, the City Engineer; E. R. Patterson was from January, 1920, to May, 1923, the resident engineer, and Thomas W. Sparrow since May, 1923, has been the resident engineer for Charles F. Mebus, consulting engineer.

Notable Improvements in Street Lighting in 1923

THE year 1923 was notable in many respects in the annals of street lighting.

Traffic has continued to multiply so rapidly that the present systems of lighting thoroughfares in most cases are inadequate, and in an effort to correct this condition and relieve night congestion of traffic, many cities have realized the necessity of revamping their entire street-lighting systems.

Prominent among these are St. Louis, where \$8,000,000 was voted for street lighting, and where in the next five years at least 45,000 ornamental lighting standards will be installed. The District of Columbia is considering the installation of a complete new system involving between 20,000 and 30,000 new ornamental units at an expense of over \$4,000,000 to the central station and to the district. The city of Columbus is experimenting with various types of new street-lighting systems before applying for a bond issue to replace the present equipment.

These are the most prominent examples of the larger cities that are considering the wholesale replacement of present street-lighting facilities, but there are numerous other cases where similar improvements are under way, including the creation of special lighting districts and the extension and strengthening of existing systems. According to the *General Electric Review*, in all these cities there was a noticeable trend toward high-intensity lighting in the business districts. The effect of such systems on the character of modern street lighting is readily shown by the increase in the light intensity on some of the recently equipped streets, included in the accompanying table:

INCREASES IN INTENSITY OF ILLUMINATION AS COMPARED WITH SUPERSEDED SYSTEMS	
Market Street, Lynn	18 times
Broadway, Saratoga	15 times
Market Street, San Francisco.....	15 times
Triangle District, San Francisco.....	12 times
South State Street, Chicago.....	11 times
Main Street, State Street and Broadway, Salt Lake City	8 times
Broadway, Los Angeles	6 times

In addition to ornamental high-intensity systems for business districts, there is a definite trend toward ornamental lighting of high intensity in other parts of the city. In Syracuse, N. Y., for instance, where the business district will be lighted by ornamental arc lamps, the entire residential district will be lighted by lanterns on ornamental standards.

Most of these cities are planning their new systems in a comprehensive and intelligent way. They are first analysing their requirements, not only for the present, but over a period of years. Lansing, Mich., for example, determined upon a lighting plan, and selected lighting units and ornamental standards of various sizes and intensity for different parts of the city, but all with the same architectural features. Some of the principal thoroughfares in residential districts have already received this treatment, and probably during 1924 the business district will be intensively lighted. Even if it requires a number of years to complete the program, there is always the assurance that there will be complete symmetry and harmony from an architectural and illuminating standpoint among all districts of the city.

For several years there has existed a demand for a relay that could be connected into a series circuit to operate a switch in a multiple circuit, so that incandescent lamps on multiple circuits could be turned on and off in unison with the starting up and shutting off of an arc lamp circuit. A

device developed to meet these conditions has been placed on the market, consisting of a coil that is connected into the series circuit, while inside the coil is an armature which will open and close a mercury switch located below, as the current goes on and off. The mercury switch is connected on one side of the multiple circuit, so that it opens and closes this circuit when the mercury is tipped from one side of the tube to the other. The series coil is supported by a large porcelain insulator, and the multiple circuit is kept a sufficient distance from the series circuit so that there is no danger of its coming in contact with it. The only connection between these two circuits is an insulating rod which tips the tube from one position to the other. This tube is large enough to carry 25 amperes on a 110-volt circuit, or 15 amperes on a 220-volt circuit.

A special fixture was designed for hanging over the intersections of streets so as to illuminate the traffic officer. It is provided with a glass reflector that has been copper- and silver-plated and is shaped so as to produce a concentrated beam of light equivalent to 5,500 candle-power. Under normal conditions the traffic officer is rendered visible in strong relief for distances up to 1,500 feet.

The adequate lighting of highways, which was first rendered practicable in 1921, has been greatly extended, and at the close of 1923 between 400 and 500 miles of road had been provided with this system of illumination.

Aid Available for Local Art Movements

THE AMERICAN FEDERATION OF ARTS, of Washington, D. C., the national body uniting all the principal art museums and art societies of this country, is extending its membership in some eighty-five cities by the formation of local chapters. These chapters enable the people locally interested in art to link themselves up with the national headquarters for art activities, and both receive and furnish in part the support of the most influential organization of its kind. The chapters frequently take the initiative in local art movements and, in some instances, have been instrumental in the establishment of permanent art museums.

Local chapters have many advantages. Federation members are entitled to free admission to all the leading museums of this coun-

try; the chapter receives special consideration when it desires to bring to its city one of the fifty loan exhibits of the Federation, etc. There are half a million dollars' worth of these exhibits, consisting of paintings, etchings, sculpture, and industrial art, obtained from the Metropolitan Museum in New York, the National Academy of Design, etc., and from the artists direct.

Individual members of these chapters may receive small collections of prints and etchings for leisurely examination and display in their homes, selection and purchase, and receive a discount on such purchases. All members are also entitled to receive without charge the *American Magazine of Art*, a lay publication presenting the newest developments in contemporary art.



A PANORAMIC VIEW OF ARTESIAN PARK, SHOWING A PORTION OF THE WELLS

Improvements in the Water-Supply of Ogden City, Utah

By B. B. Brewster

THE constantly increasing demand for water in Ogden City, Utah, led Mayor Francis, the City Commissioner and the City Engineer, in 1920, to investigate ways and means for increasing the supply. At that time, L. M. Winsor, of the Department of the Interior, and the writer were testing a number of wells in the state with a portable outfit mounted on a truck. This outfit consisted of a Sullivan belt-driven compressor, a gas engine, an air receiver and other necessary equipment. Arrangements were made to test a number of the city wells, to determine their capacities.

The supply for Ogden City is secured from a number of artesian flowing wells at Artesian Park, located at the head of Og-

den Canyon, about 10 miles northeast of the city. The source of the supply is a water-bearing gravel stratum, lying approximately 150 feet below the surface. At the head of the canyon this water-bearing stratum meets an impervious formation standing in a tilted position, which helps to form a natural catch-basin for the water originating in the surrounding mountains. The water filters its way through the various formations to the gravel watercourse. This condition gives a natural flow of water of a somewhat limited capacity, which has been collected and carried to the city for years, forming the entire city supply, but was not able to meet the growing demand. There are 34 wells in this basin, 18 with 6-inch casing, and 16 with 4-inch casing,



PORTABLE OUTFIT USED BY THE DEPARTMENT OF THE INTERIOR FOR TESTING WELLS

**NATURAL FLOW****BACK-BLOWING**

ranging from 120 to 200 feet in depth. In testing a number of these wells, an air-line was lowered through a tee, and a valve was located on the discharge. The air reducing the weight of the discharge column increased the flow, and the valve upon the discharge was used to back-blow and clean out the sand and gravel adjacent to the bore holes.

This work showed that the stratum was unusually plentiful and that constant pumping within reasonable limits would in no way diminish the supply.

In the spring of 1922, W. S. Craven, City Engineer, decided that the air-lift system would be best suited for the pumping

of the flowing wells to increase their capacity, as it would be possible to install a central plant with multiple units to pump all or any group of wells. Furthermore, during the part of the year that the natural flow of the wells was sufficient to furnish the supply, the air-lift installation would not interfere with the flow. Inasmuch as there are no moving parts outside the power-house, the system was always ready for operation, even after long shut-downs. By the use of this system, any one of the wells can be back-blown and cleaned while the others are in operation. If by continuous pumping the water head at any time should be lowered, it would be only neces-



FIVE COMPRESSORS USED TO FURNISH AIR FOR THE AIR-LIFT PUMPS AT ARTESIAN PARK, OGDEN, UTAH

sary to lower the air pipes in the wells to restore the original efficiency.

In 1922, eight 6-inch wells were equipped with Sullivan air-lift pumps, including two single-stage air compressors with 50-horsepower Westinghouse motors. The two compressors were installed to more economically meet the varying demands. The results obtained in 1922 were so highly satisfactory that in 1923 three more compressors, a booster and 28 well equipments were installed, giving a very flexible plant capable of taking care of any demand from minimum to maximum.

Unique Method of Repairing Large Water-Mains

A UNIQUE feat was recently accomplished in Baltimore when a cracked 48-inch water-main was welded without disturbing its position in the ground. According to the report of V. Bernard Siems, Water Engineer of the Baltimore Water Department, a leak on North Avenue at Oakhill Avenue was found to be caused by a straight latitudinal crack on the upper side of a 48-inch pipe and extending almost half-way around it.

It was estimated that the usual method of removing and repairing the damaged section of the pipe would have cost \$1,040, and on account of the size of the pipe, the section of which weighed roughly 9,000 pounds, the work would have consumed considerable time, during which the water-main—in this particular case an important Low Service Zone supply line—would have remained out of service. To expedite the repair work as well as to save costly materials, the crack was welded by the Electric Welding Company of America under the direc-

The booster is used for compressor cooling water and lawn sprinkling. During 1923, 26 wells, 17 of which are shown in one of the illustrations on page 279, were equipped with cement collector basins, from which the water flows by gravity or may be pumped during high demand.

It is interesting to note that air-lift pumping has increased rather than decreased the water-supply, by opening up the water-courses in the gravel beds. This is shown by the fact that the "draw down" in static head is 3 feet less than it was when the wells were first tested.

tion of the manager, A. Rhodes Knight, who has developed a process by which cracks in cast iron pipe can be welded while the damaged section remains in position.

The choice of materials used in the process is the result of much experimental work and has made possible a weld which hitherto was generally believed to be impractical. The welding machinery used was mounted on an automobile truck and generated its own electricity. The only preparatory work necessary was to expose the main and to drain the water in the pipe below the limits of the crack. The entire operation required but a few hours and cost but \$304.92, the cost of welding alone being \$100. Inspection of the repaired section of the main when again in service showed the weld to be water-tight. The success of this method of emergency repair work is also notable in that a saving of \$735.08 was effected, and is illustrative of efficient and progressive water-works practice.

Building a Veneer Surface for North Carolina Roads

AN important application of research work by the North Carolina Highway Commission is the construction of stone veneer on earth roads. In the South there is an exceptionally large mileage of earth roads consisting mainly of sand-clay, top-soil and gravel types. The bearing power of these roads is high and the strength is great. There is still a problem surrounding them, since they offer very little resistance to abrasion, and with them the dust problem is great.

The problem is to secure some means of protecting the surface against abrasion and to abate the dust nuisance. This seems to have been found in the stone veneer surface, where the quality of an asphalt wearing surface is combined with the strength of an earth road. There have been several attempts made to apply bituminous material to earth roads. These, in general, have been unsuccessful because if the bituminous material is sufficiently light to penetrate the surface it has no binding power or strength whatever, and if the bituminous mate-

rial is sufficiently heavy to have a binding value it would congeal on the surface and peel off, on account of the fact that a dust mat was formed underneath the bituminous material.

This problem seems to have been solved by applying a veneer of stone approximately three inches in size to the earth road surface and rolling it partly into the surface, after the surface has been scarified or loosened, and then penetrating the top of the stone with the bituminous material at a consistency to give sufficient strength to hold the material in place and afford resistance to wear. This bituminous material is then covered with proper sized stone and rolled and opened to traffic. The stone is held in place from below by the earth road and has become an integral part of it. The bituminous material holds the stone in place on the surface and affords a resistance to traffic abrasion. Thus we have the combination of the strength of an earth road and the wearing qualities of an asphalt pavement.

—North Carolina Highway Bulletin.

Suggestions for Improving the Present Budget Procedure in Cities

By A. E. Buck

New York Bureau of Municipal Research

The Basis for Control of Municipal Funds

As the indispensable function of a municipal budget is to control the year's financial program, the set-up of the budget must be designed, first of all, to guarantee control, and then, secondarily, to furnish the means for presenting information, educating the public, and developing plans.

The author of this article is the staff member of the New York Bureau of Municipal Research in charge of budget administration. He has had a broad and practical experience in budget-making, and has done a great deal to untangle and simplify budget classifications.

Mr. Buck does not recommend the classification used by the United States Census Bureau in its Financial Statistics of Cities as the basis for a budget. In his judgment, that classification is designed to summarize a great mass of diversified information and not to furnish the basis for control which is essential in a budget.

WHILE considerable progress has been made in the direction of developing and classifying the information needed for budget-making, much remains to be done in this field.

Lack of Uniformity in Budget Classifications

There is still a notable lack of uniformity in the expenditure and revenue classifications used by the various cities for accounting and budget-making purposes. Each city in adopting, for example, an expenditure classification, modifies the main classes, changes them around, combines them, and shifts sub-classes or items to other classes or groups, so as to adapt the classification to the peculiar procedure of the local accounting system or the whims of the fiscal officers. This naturally makes it difficult to set up expenditure comparisons between the cities. The smaller cities want a classification with only a few main heads, while the larger cities can use a classification with a considerable number of main heads. It seems desirable as a next step to devise an expenditure classification with only six or seven main groups or classes, one that will combine the essential features of the so-called object and character classifications and that will be easily adaptable to the ex-

penditure needs of either a small or a large city. The following classification is suggested as meeting these needs:

- 10—Services—Personal
 - 11—Salaries and wages regular
 - 12—Salaries and wages temporary
 - 13—Other compensations
- 20—Services—Contractual
 - 21—Communication and transportation
 - 22—Subsistence, care and support
 - 23—Printing, binding and advertising
 - 24—Heat, light, power and water
 - 25—Repairs
- 30—Commodities
 - 31—Supplies
 - 32—Materials
 - 33—Repairs (parts)
- 40—Current Charges
 - 41—Rents
 - 42—Insurance
 - 43—Refunds, awards and indemnities
- 50—Current Obligations
 - 51—Interest
 - 52—Pensions and retirements
 - 53—Grants and subsidies
- 60—Properties
 - 61—Equipment
 - 62—Buildings and improvements
 - 63—Land
- 70—Debt Payments
 - 71—Serial bonds
 - 72—Sinking-fund installments

Of course, the sub-classes of this classification may be further expanded. Assuming that the city's activities are departmentalized along functional lines, then the organization units in conjunction with such a classification will show the essential in-

formation for budget estimate purposes, namely, what department or division is to do the work, what services and commodities are needed, and how much they will cost.

Another question remains to be answered; and that is, how the cost of the services and commodities needed is to be met. The revenues and other receipts of cities should be classified in a uniform manner. From the standpoint of comparative revenue data, this is just as essential as the uniform classification of expenditures. So far very few cities have attempted any systematic classification of their revenues. A simple revenue classification should be devised that will contain only about a half-dozen main groups or classes and that will combine the source, base and item designations. The following classification is suggested for cities:

- 10—Taxes
 - 11—General property
 - 12—Poll
 - 13—Income
 - 14—Business
 - 15—Inheritance
 - 16—Miscellaneous
- 20—Rights and Privileges
 - 21—Licenses
 - 22—Permits
 - 23—Franchises
 - 24—Concessions
 - 25—Rents
 - 26—Royalties
- 30—Services and Sales
 - 31—Fees
 - 32—Sales of services
 - 33—Sales of commodities
- 40—Interest and Premiums
- 50—Fines and Forfeitures
- 60—Grants and Donations

In using the above classifications, the various revenues under each class or subclass should be specified.

Construction or Improvement Programs

Another point to emphasize in improving city budget-making is the adoption of construction or improvement programs extending over a period of five or ten years. This is especially applicable to street improvements, sewer construction, park and playground developments, and institutional developments. Recently a few cities have worked out and adopted improvement programs extending over a period of five years. Such programs show just what projects are to be undertaken and completed during each year, how much they will each cost, and how the money is to be raised to finance

them. If part of the improvements are to be financed by bonds, the redemption charges can be spread equably over the future years so as not to overburden any one year and thereby increase the tax rate unduly. The different improvements can be distributed over a period of years, if necessary, so as to meet the growing needs of the city and at the same time not to burden the taxpayers with special assessments or other payments. The residents of the city then know exactly when they are going to get certain improvements and are not continually bothering the city council or the administration about them. In the case of institutions, the directing heads know definitely just how much they can expand each year under the building program as adopted. When it comes to making up the annual city budget, the matters relating to the development and financing of permanent improvements have been practically settled by the adoption of the improvement program. These matters do not come up *de novo* with the preparation of each budget.

More Informing Budget Document

The budget document prepared and published by most city governments is quite unsatisfactory from the standpoint of giving complete information about the fiscal program. Sometimes the detailed information necessary to the careful scrutiny of the plan is lacking. Sometimes the great mass of detailed information is not summarized so one can get a bird's-eye view of the budget plan. Without summaries the budget document is of little value to the general public.

What is needed is a budget document that is simple in arrangement, that presents all the necessary information about the proposed expenditures and the means of financing them, and that is carefully summarized so it can be easily understood. The main essential of the budget document of this kind is a single statement that gives a complete picture of the proposed expenditures balanced with the anticipated income of the city government. This general statement should be supported by five or six more detailed statements arranged in such a way as to present all of the outstanding features of the budget plan. It will then be unnecessary for the general public to study the detailed estimates, except to verify certain of the summary figures that may be ques-

tioned. From these summary tables the newspapers would draw most of the budget information for publication. In addition to the summary tables, the mayor or the manager should write a simple story, telling clearly and concisely about the main features of the budget plan, and it should be included in the front of the published budget document. This story should be such that all the newspapers in the city would publish it along with certain figures that they might draw from the summary tables.

Flexible Appropriation Ordinances

Cities usually enact appropriation ordinances that either set out the appropriations in extremely itemized form or combine them in large lump-sums. Neither of these forms is desirable. When enacted in great detail, the administration is tied hand and foot in the use of the appropriations unless a great many changes or transfers are made during the year. This forces the city council to have to "tinker" with the budget plan at frequent intervals, a thing that should be avoided if possible. When appropriations are made in lump-sums, there is the possibility of administrative laxness in carrying out the budget plan unless great care is exercised in the accounting control and reporting of expenditures. If lump-sum appropriations are made by the city council subject to "executive allotments" when the work is ready to be carried out, then this difficulty of transfers and shifts can be avoided. These allotments act as a restriction upon any loose spending, and since they are made by the chief executive the city council is relieved of having to bother with the budget except when extraordinary situations may arise. Another advantage of allotments is that the lump-sum amounts are not definitely budgeted out until just before the particular work to which they apply is begun, hence the estimates are again scrutinized at a time when they may be more carefully determined than when they were originally before the city council. By this method of putting on the city executive an allotment of former estimates, considerable money may be saved because of changed conditions that were not anticipated when the original estimates were prepared.

Minimum Changes in the Budget Plan After Adoption

Changing the budget after it has been

adopted by the city council is one of the worst features of the budget procedure in a number of cities. When once the budget plan has been carefully thought out and adopted, it should be strictly adhered to by the city council unless some extraordinary or unforeseen circumstances should arise that require certain changes. Of course, it is usually necessary during the year to make a number of minor shifts or transfers in the plan as adopted, but these can be taken care of under the system of executive allotments mentioned above without vitiating the budget plan. The point is this: there is little use of going through the procedure of making up and adopting a comprehensive budget plan for the city unless it is to be binding upon the council as well as the administration. If the council is to be permitted to change from time to time the fiscal policies outlined in the budget, if it is to be allowed to appropriate additional revenues coming in during the year that have not been anticipated in the budget, then the budget fails to be what it was designed to be—a controlling financial plan.

Wider Publicity on the Budget

In most cities there is great need for wider publicity about the city's fiscal affairs at the time the budget is being adopted by the city council. The budget document, however well it is prepared, may not be read very widely by the residents of the city. A more striking means of supplying budget information directly to the public must be employed in most cities.

A few cities have tried public meetings as a means of giving to the citizens the salient facts about the city's fiscal program and actual accomplishments before the budget is adopted by the city council. Where this has been the practice for two or three years, it has stimulated the public interest in the budget program to a surprising degree. In the manager-governed cities the mayor usually presides over these public meetings, speaking on the fiscal policies as set forth in the budget and inviting questions and criticisms. The manager is also present at these meetings to explain any of the details relative to the expenditures and revenues of the city government. Such meetings make live news for the papers of the city, so that those citizens who fail to attend get the story through the newspapers.

The need for budget exhibits should be emphasized. Up to the present time only a few cities have made use of such exhibits. They should be set up periodically during the budget-making period in the city hall or some other building that is convenient for the people to attend. They consist of charts, diagrams, maps, placards, samples, and so forth that tell quickly and easily the story of where the city gets its money, how

it spends this money, and what it gets for it. It is possible now for the city government to produce motion picture films of its more important activities, showing just what work is being done, and to send these films around the city to be shown in the different picture theaters. Such exhibits help the public to visualize and understand the work of the city government and are valuable means of civic education.

Village Manager Prefers Weekly Newspaper Articles to Annual Municipal Reports

TO THE EDITOR OF THE AMERICAN CITY:

I was very much interested in the articles in the January, 1924, issue of THE AMERICAN CITY on annual reports of various municipalities operating under the commission-manager form of government. In my opinion, one of the greatest weaknesses of this form of government, as well as of the older form, is its failure to keep the public generally informed as to the actual status of the various municipal activities. In the past year, in our village, we have abandoned the plan of issuing an annual report, and instead have been using newspaper space, giving weekly publicity to municipal matters of general interest. Through the courtesy of one of the local papers, this space is secured without cost, and the articles are prepared by the City Manager.

There has been much favorable comment on these newspaper articles, and it is believed that they are widely read and generally appreciated. In preparing the articles, it has been our intention to give only actual facts and fig-

ures that can be verified by any one sufficiently interested to investigate, and no misleading propaganda is attempted.

It is our belief that this form of publicity is much more effective than the issuing of an annual report. Enclosed is a *clipping of one of the articles concerning the fire department, containing a summary of the Fire Chief's annual report. This is a sample of the articles published. Incidentally, we are quite proud of our volunteer fire department and the very good report it was able to make for the year 1923. It challenges any other volunteer fire department in a town with a population of 2,500 to better it.

J. H. BENDER,
City Manager.

Village of Clayton, N. Mex.
January 19, 1924.

*EDITORIAL NOTE.—This article reports that for the year 1923 Clayton had the best fire record in the history of the village. Only six alarms were turned in during the entire year, and a total fire loss of but \$165 was reported.

Denver Inscribes Its Colonnade of Civic Benefactors

SINCE the publication of the item on "Denver Has Announced Its First List of Civic Benefactors" in the February, 1923, issue of THE AMERICAN CITY, the Municipal Commission on Civic Benefactors of the city of Denver has carried out its plan of inscribing the names of those citizens on the colonnade in the south end of the civic center. The list of thirty names has been placed on the wall at the right of the colonnade here shown, and additional names of civic benefactors will be given similar recognition from year to year. The inscription on the colonnade reads:

"IN ORDER TO GIVE EFFECT TO THE OFT EXPRESSED INTENTION OF THE LATE MAYOR ROBERT W. SPEER, THE GOVERNMENT OF THE CITY AND COUNTY OF DENVER, COLORADO, HERE RECORDS WITH GRATEFUL APPRECIATION THE NAMES OF CIVIC BENEFACTORS WHO BY GIFTS OF MATERIAL CHARACTER HAVE ADDED TO THE BEAUTY AND DISTINCTION OF THIS CITY."



Construction and Maintenance of Sand-Clay and Top-Soil Roads---Part II

By W. R. Neel

State Highway Engineer of Georgia

Maintenance

WITH inadequate funds maintenance is a hopeless undertaking; therefore, the most important feature of successful maintenance is adequate financing.

The improvement of an entire system of highways either by maintenance or by construction attracts to these improved roads traffic from other roads and encourages and develops new traffic during winter months and rainy weather which, before the improvements were made, never existed; passenger bus lines, freight hauled by motor trucks, new sawmills and various other industries dependent upon good roads spring up.

The lack of good roads, the innumerable number of "road terrors," such as bog holes, rotten bridges, etc., have discouraged the use of our roads in bad weather, but the minute these weak links are removed the traffic multiplies—and always a class and weight of traffic in excess of the safe carrying capacity of the temporarily surfaced road.

The large mileage of sand-clay and top-soiled roads constructed in Georgia, together with the work done by the maintenance organization, have made possible continuous use of the roads the entire year. This has put the roads to a severe test, and I am convinced that unless the heaviest traveled roads are paved within the next few years they will rapidly deteriorate and again become unserviceable at certain seasons of the year.

It is impossible to devise an ideal maintenance scheme which will be suitable for each state. The equipment and organiza-



AN IMPROVED ROAD IN EMANUEL COUNTY, GA., MADE BY SCARIFYING A WORN-OUT SAND-CLAY ROAD

tion must be selected after a careful study of the roads to be maintained. We have in Georgia eleven divisions, and the equipment and organization vary somewhat in each of them.

The maintenance of dirt roads requires an intimate knowledge of the particular road to be maintained, the class of soil, what effect water has on it, and how rapidly the soil dries out after rains. Certain road soils should be machined only when absolutely necessary to remove deep ruts which cannot be removed with the road drag or float. Certain soils require very careful dragging with just the right amount of moisture content to form a hard crust, after the forming of which it is very important to use no machine or type of tractor that will break this crust.

It is very important that the maintenance man be familiar with the seasons in order to anticipate rains in doing certain kinds of work on the road surface in his charge. Frequently it becomes necessary to plow up the road in order to thoroughly remix the material in the road surface. If this is done at a time of year when continuous

rains may be expected, the result will frequently be disastrous and even result in that particular section of road becoming impassable. Yet a certain amount of rainfall is required to aid in resetting the road surface material; otherwise, this newly plowed and harrowed section of road will become a dust bed, and a large amount of material which has been hauled on to the road will be lost by being carried away by the winds and traffic.

A maintenance man must be familiar with every hundred-foot section of the road under his charge. One part of the road which gets bad in wet weather may be remedied by the application of a few inches of coarse sand thoroughly cut into the surface; another section which gets soft and dusty in very dry weather may be improved by the addition of a good quality of clay.

On a long section of improved sand-clay or top-soiled roadway there are relatively few places that get bad in unfavorable weather. Careful study of each individual place by the patrolman and a simple remedy which can generally be easily

and cheaply applied will result in the gradual improvement of a large mileage of highways, provided the traffic is not of such a nature or of such a volume that there is a general breaking down of the entire road surface when weather conditions are the slightest bit unfavorable. The only remedy for a condition of this kind is to have at one's command sufficient funds to construct a surface adequate for the traffic.

After a top-soil or sand-clay road has been properly constructed, the ditches should only be machined when absolutely necessary to provide a suitable waterway, and great care should always be used to prevent the mixing of the ditch material with the road-surface material. A fringe of Bermuda grass growing on the shoulder of the road will aid in separating these materials.

Patrol Maintenance

One hundred patrol sections properly

equipped are a sufficient number for a 5,000-mile system of roads. Forty additional outfits equipped for heavy work, such as reshaping, scarifying, cutting ditches, etc., are a sufficient number of this class of equipment for this system, and ten supervisors with one assistant each can lay out and direct the entire work.

The training of maintenance men is the biggest undertaking of all, and after the state has made the large investment in these men that is necessary before their work really becomes most effective, radical changes in the laws governing the highway department should not be made which would cause the adoption of different methods and the consequent loss of the money already invested in the education and training of these men.

There is no better way of determining *where* and *when* and *how* to improve the road than by a careful study of maintenance effort and cost.

A sand-clay road will adequately serve the traffic of certain districts; in others gravel is required; and there are still other roads for which it would be

a waste of money to construct anything less than the highest type of pavement. This statement might not appeal to you so forcibly before the improvement is made as after it is made, when the inter-city traffic which might be almost negligible before the improvement has been made, will become very heavy. The rural or local traffic will also increase, not only because the road can be used more days of the year by those accustomed to use that particular road, but also because a great many will use the improved road because it is so much better than the other available roads.

In this case, unless the improvement is adequate for the traffic, not only will maintenance cost become prohibitive, but traffic will be seriously handicapped in its use, and at certain seasons of the year actually blocked, as earth roads with a certain volume of traffic cannot be maintained in a passable condition through rainy spells.

Care for the Majority

The great majority of our roads will always be without a hard surface; therefore, the study of the most effective and most economical method for maintenance of dirt roads is most important. In the end the maintenance of this class of road will be the big problem, even overshadowing the construction. A combination of the so-called patrol and gang system of maintenance is best. Proper maintenance is the most effective and immediate way to serve traffic.

An Ideal Maintenance Organization for a 50-Mile Section

The following tables list the light equipment, labor, gas, oil and repair expenses for a 50-mile patrol section:

LIGHT EQUIPMENT	
2—Tractors	\$2,800.00
1—Truck	600.00
2—Road machines	1,200.00
1—Three-way drag	300.00
3—Small drags	40.00
Small tools	100.00

\$5,040.00 X 100 Sections

25 per cent depreciation

HEAVY EQUIPMENT	
1—Ten-ton tractor	\$6,000.00
1—Road machine	1,750.00
1—Road machine	1,200.00
1—Three-ton truck	2,400.00
1—Mowing machine	600.00

\$11,950.00 X 40 Sections

25 per cent depreciation

FIFTY-MILE SECTION—LIGHT MAINTENANCE	
Equipment Valued at \$5,040.00	
Labor, equipment, gas, oil and repairs..	\$495.00
25 per cent yearly depreciation.....	105.00
6 per cent interest on equipment investment	25.90

Total \$625.90

FIFTY-MILE SECTION—HEAVY MAINTENANCE	
Equipment Valued at \$11,950.00 for Use on 125-Mile Section	
Labor, equipment, gas, oil and repairs....	\$288.00
25 per cent yearly depreciation.....	99.58
6 per cent interest on equipment investment	23.90

Total \$411.48

OVERHEAD AND OFFICE EXPENSE	
General supervision, special supervision, mechanical labor, accounting, office overhead, supplies, etc.	
	\$117.00

All expenses chargeable to fifty-mile section

Total	\$1,154.38
For 1 mile.....	23.087
For 1 mile*	277.05

The above expense provides continuous work throughout the entire year

FIFTY-MILE SECTION Labor, Equipment, Gas, Oil and Repairs	
1—Patrolman (foreman and tractor operator)	\$100.00
1—Machine operator	60.00
7—Truck driver or tractor operator.....	50.00
3—Laborers	90.00
2—Tractors (Cletrac type) gas, oil and repairs	100.00
1—One-ton truck (hauling laborers, tools and repair materials) gas, oil and repairs	50.00
2—8-foot road machines, repairs and replacing blades	10.00
3—Small drags, repairs and replacing blades	5.00
1—3-way drag or maintainer, repairs and replacing blades	20.00
Small tools, picks, shovels, pitchforks, mattocks, wheelbarrows, repairs and replacing same	10.00
	\$495.00

Note: The above expense for light outfit.

ONE-HUNDRED TWENTY-FIVE-MILE SECTION

Labor, Equipment, Gas, Oil and Repairs	
1—Tractor operator	\$100.00
2—Machine operators	120.00
1—Truck driver	50.00
2—Helpers	60.00
1—Ten-ton tractor—gas, oil and repairs....	320.00
1—12-foot road machine with scarifier attachment	

1—10-foot road machine—repairs and re-placements	30.00
1—Three-ton truck—gas, oil and repairs..	140.00
1—Mowing machine, repairs and replacements, small tools, picks, shovels, pitchforks, mattocks, wheelbarrows, repairs and replacing same.....	10.00
	\$720.00

Note: The above expense for heavy outfit working in addition to the small outfits. In the average state having 5,000 miles of roadway under maintenance 100 light outfits will be required working in conjunction with 40 heavy outfits.

*Per year.

This 50-mile section would be under the charge of a patrolman who would also operate either the tractor or the road machine. He would be assisted by a machine operator, a truck driver and three laborers. On a system of 5,000 miles of road there would be 100 such outfits.

In addition to the lightly equipped outfit, there would be an outfit equipped for heavy work. This outfit would cover 125 miles of road, passing from one 50-mile section to another and operating under the direction of the patrolman in the section in which the outfit is at work. There would be 40 such outfits in the above-mentioned 5,000-mile system.

In addition to the expense of the above-mentioned outfits, there would be the division overhead and office expense; the ten supervisors and the ten assistants, a division mechanic and helper, accounting, office supplies, etc., of each division; then there should be in each state a central shop equipped for the overhauling and heavy repair work necessary to the successful operation and maintenance of so large an amount of valuable equipment and machinery—amounting in all for the 5,000-mile system to a little less than one million dollars.

As shown by the detail tabulations, the sum of the operating cost, yearly depreciation cost on equipment, interest on both the light and heavy maintenance outfits, and the overhead and office expense, there is a total cost chargeable to every 50-mile section per month of \$1,154.38, amounting to a monthly charge of \$23.087 for each mile of road and a yearly charge of \$277.05 per mile.

This amount includes a yearly depreciation charge of 25 per cent and interest at 6 per cent on the equipment items. The interest charge should probably not be included. The supervisors of each division should report directly to the division maintenance engineers. There should be a chief maintenance engineer reporting directly to

the State Highway Engineer, attached to the main office in order to coordinate the work in the various divisions.

This, in my opinion, is a maximum outfit required to maintain the top-soil or earth roads on a 5,000-mile state system 365 days in the year; provided traffic is not too heavy, and provided the rainy spells are not of too long duration. Under these conditions an increase in maintenance expense would not materially improve matters. Earth roads will get wet, and when wet a sufficient amount of traffic will cut them up.

When to Drag

Experience on most roads in Georgia has shown that after a rain roads are in condition for dragging for not longer than two days following. With one dragging outfit on each section of the average length of 50 miles, it is possible to drag effectively, after each rain, one-third of the section. This requires three rains during the month to cover the entire section one time, or six different rains to cover it twice during any one month, the minimum number of draggings necessary to keep any of our dirt roads in fair condition.

With two outfits it is possible to drag an entire section after each rain if a suitable truck is used to drag, in addition to the tractor. In this way, by having a truck suitable for dragging purposes on each 50-mile section in addition to one tractor, it will only require two rains per month to keep the roads in reasonably good condition. Thus, it is seen to what a great extent the maintenance of dirt roads must depend upon the elements. By reducing the number of days the equipment and men are used in dragging, a greater number of days remain for hauling suitable repair material, reshaping ditches, opening up waterways, etc.

As shown in the equipment list, each light outfit has a 1-ton truck not only for hauling the material for patching road surface but also for the rapid transportation of the men to and from work.

I am indebted for a great deal of the information contained in this paper to Dr. C. M. Strahn, Dean of Engineering of the University of Georgia, who was probably the first engineer to begin to make a scientific study of top soils for surfacing materials, and who is a recognized authority.

An Appeal to Courtesy

AFTER vain attempts to make it a violation of the law for motorists to operate their machines on street-car tracks in the business district, the Los Angeles Railway conducted a campaign appealing to the fair-mindedness of the drivers themselves. During a Christmas holiday season, when traffic difficulties were at their worst, posters were placed on the right rear and left front of the cars, where they were plain to every eye, and were kept there for about fifteen days. The two posters read: "Mr. Autoist: Street-Car Riders Are in a Hurry, Too. Please Keep in Line. Thank You." And "Mr. Autoist: Give the Street-Car Riders Fair Play. Please Don't Block Traffic. Thank You."

"By putting the language in terms of the street-car rider rather than the street railway," said J. G. Jeffery, Director of Public Relations

for the Los Angeles Railway, "it proved an effective means of enlisting the cooperation of the motorists, and very good results were procured. The conspicuous signs made it necessary for a selfish driver to have a pretty thick skin to be blocking 90 or more street-car passengers and staring one of the posters in the face."



For the purpose of keeping this appeal in the minds of drivers, the railway company detailed a young lady trained in traffic affairs and conditions to spend the two weeks preceding the holiday season on the cars in the business district. Each time she saw an automobile driver deliberately blocking the path of a street-car, or in any way interfering with a street-car rider's rights, she called the driver's attention to

the appeal pasted on the car, and at the same time gave him a few hints on respect for the time and property of others.

To Eliminate Fire Hazards Resulting from Parking Automobiles

By William P. Capes

Secretary, Conference of Mayors and Other City Officials of the State of New York

RECOGNIZING the increasingly serious fire hazards from the parking of automobiles in streets and alleys in congested districts of cities, the New York State Bureau of Municipal Information has issued a special report on this problem. This report is based on data secured by questionnaire from 130 American cities, and on a study of the problem by a special committee of the State Conference of Mayors and Other City Officials, consisting of Mayor John A. Giles of Binghamton, and Fire Chiefs Elias J. Shadwick, Saratoga Springs; Henry R. Yates, Schenectady; Walter Jones, New Rochelle, and E. P. Murphy, Buffalo.

Findings of the Committee

The findings of the committee are summarized as follows:

Our survey shows that the parking of automobiles in streets and alleys, especially in congested districts, results in accidents to, and impedes the progress of, fire apparatus en route to fires, delays the placing of apparatus and the stretching of hose, hampers the work of firemen at fires, and lessens the efficiency of fire-escapes. To solve these serious problems, congestion of traffic must be eliminated and automobiles must be either kept away from buildings or so parked as not interfere with the operation of apparatus and the work of firemen in the event of a fire, especially in the business or high-value districts. The practice of chasing or racing with fire apparatus must be stopped and vehicles must be kept away from burning buildings.

Based upon our studies and the experiences of, and suggestions made by, fire departments of American cities, we make the following recommendations:

1. The elimination of the parking of all automobiles, except to take on or discharge passengers or freight, in all streets and alleys in congested districts is the only action a city can take which will effectively and permanently solve all of the problems herein presented. We believe that eventually this action will have to be taken by all cities. How soon such a regulation will have to be adopted by an individual city will depend upon local conditions, such as the layout and width of the streets, the density of traffic in its business district, the height of buildings and the rapidity with which motor

traffic increases. Cities can gradually approach this permanent solution by providing for parking prohibitions during certain hours when congestion is the worst, or in certain streets where traffic is the heaviest. Exception may be made to cars parked single file and parallel to the curb when attended by driver. We do not believe that time limits on parking in a street will help to solve any of the fire department problems.

2. When parking can or must be permitted, we recommend the following:

- (a) Cars must be parked only in single file, parallel to the curb and at least 5 feet apart, unless parking in the center of the street is possible.
- (b) No parking within 20 feet of a fire-hydrant; 25 feet of the crosswalk at a street intersection; 75 feet of a street intersection where a trolley car stops to take on or discharge passengers; 15 feet of the entrance of any place of public assemblage; and 25 feet, on both sides of the street, from any fire-house.
- (c) No parking in alleys, except for a limited time for actually loading or unloading.
- (d) Prohibiting locking of gears and wheels of parked cars.
- (e) Establishment of one-way streets and requirement of parking on only one side of street when conditions are favorable, to facilitate traffic.

3. To stop the practice of motorists chasing to, and assembling near, fires, all vehicles should be required to keep at least 3 blocks or 600 feet behind fire apparatus, and the same distance from a fire.

4. The strict enforcement and observance of these regulations.

Amendments to General Highway Traffic Law Needed in New York State

In order that the cities of New York State may carry out two of our recommendations, it will be necessary to amend the General Highway Traffic Law. We, therefore, urge the State Legislature to amend subdivision 7 of Section 15 of the General Highway Traffic Law (Chapter 655, Laws of 1917), so that automobiles cannot park within 20 feet of a fire-hydrant or within 25 feet of a crosswalk at a street intersection, or within 75 feet of such intersection where a trolley car stops to take on or discharge passengers. The present limitations in both instances are 10 feet.

Open Spaces and Road Frontages in Housing Projects--II

By F. Longstreth Thompson

Member, Town Planning Institute of Great Britain

Subdivision of Land into Building Blocks

Size.—Without attempting to lay down any precise rules for the arrangement and spacing of these minor roads, attention may usefully be directed to certain principles of design which are of general application. The most important of these is the size and shape of the blocks of land into which it is most economical to divide the areas enclosed between the system of secondary streets. We are here confronted by two opposing considerations; on the one hand, the need for convenient access imposes an upward limit upon the size of the blocks; while, on the other hand, the necessity for economy in development requires that they should not be too small. Convenience of access in this respect need only be considered from the point of view of wheeled traffic, as provision for foot passengers can be provided without materially increasing the cost of development or modifying the layout. Even then it is difficult to decide at what point access becomes inconvenient, especially as in development at 12 houses to the acre the shape of the different blocks will be far from uniform. Hence a lineal dimension must also be accompanied by a superficial measurement, and on this basis it will usually be found that blocks having an area of approximately 10 acres and with no side exceeding a length of a quarter of a mile, constitute the most economical units of development. An example of such a unit is illustrated in Fig. 6, and fur-

ther examples are shown in Figs. 8-11.

Shape.—The shape of the block is not of paramount importance in the case of open development, as the reduced density allows greater freedom of planning, and parallel roads—two house plots apart—are not only not essential, but, being generally less economical than other arrangements, are to be avoided as far as possible. Provided, therefore, that the blocks are not too narrow, nor too acute-angled, almost any shape can be developed economically. The majority of those used in practice, however, can be considered in relation to the following typical figures—the rectangle, triangle, trapezium, and segment of a circle. The sector and part-sector of a circle—forms frequently encountered—can con-

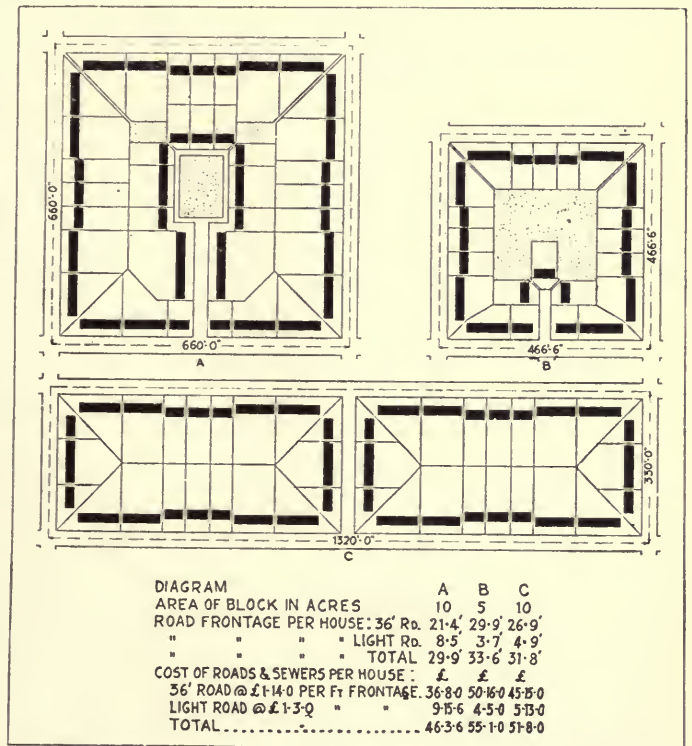


FIG. 8. COMPARATIVE COST OF DEVELOPMENT FOR RECTANGULAR BLOCKS OF DIFFERENT SIZES AND SHAPES

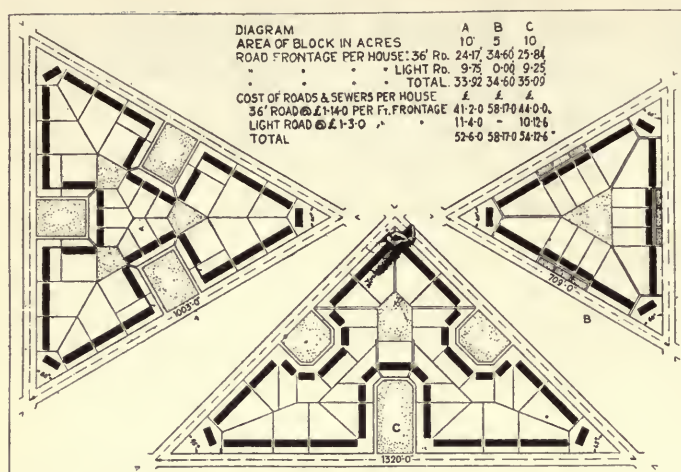


FIG. 9. COMPARATIVE COST OF DEVELOPMENT FOR TRIANGULAR BLOCKS OF DIFFERENT SIZES AND SHAPES

veniently be approximated respectively to a triangle and trapezium for the rough calculations that are necessary, while blocks of a shape too irregular for comparison with any of the standard figures must necessarily receive individual examination.

Proportions.—In order to arrive at the proportions which are theoretically the most economical for development, several factors have to be considered. At first sight it would seem that from the point of view of available frontage, those proportions would be best which result in a figure possessing the maximum perimeter for the area enclosed. If this were the only consideration, long, narrow shapes such as those illustrated in Fig. 7 would be preferable to squares or circles in which the ratio of the periphery to the area enclosed is at a minimum. But the other factors in the case act in the opposite direction. The limitations as to area and length imposed by traffic requirements automatically prevent the adoption of the long, narrow block, while the difference in cost between the light roads which can be used for the internal development of the block, and the heavier roads surrounding it, renders it desirable to make the maximum possible use of the light roads. On this account, therefore, it is advisable to employ blocks having a small perimeter but at the same time offering the greatest opportunity for internal development by means of light roads, culs-de-sac, etc. A further guide in the matter is the desirability of reducing the

loss at corners to a minimum. This factor does not affect the shape of rectangular blocks, but it has a direct bearing upon that of the other typical shapes. It has already been pointed out that the waste of frontage at a road junction is least in the case of a right angle owing to the increased loss occurring at an acute angle being much greater than the diminished loss at an obtuse angle. Hence in the case of triangular, trapezoidal, and seg-

mental blocks, the most economical form will be that in which the angles most nearly approach right angles; an equilateral triangle will, therefore, be the best shape in its group, and a semi-circle in the segmental class. But while a trapezium obviously grows more economical as it approaches the rectangular form, it loses at the same time its own characteristics, and if these are to be preserved, it is necessary to set up an arbitrary standard; under these circumstances it may be said that for a typical trapezium the best shape is that in which the acute angles are about 60°.

Dimensions.—The actual dimensions of the different-shaped blocks which comply with the foregoing conditions with regard to area, length of side, perimeter, and angles at corners, can readily be determined. Thus, amongst rectangular shapes, a square having sides 660 feet long fulfils the conditions as to area, length of side, and angles, and at the same time possesses the minimum possible perimeter; it is clearly, therefore, the most economical form of rectangle. The limitation of the angles to 60° at once determines the shape of triangular blocks, and the equilateral form also provides the smallest perimeter; with sides equal to, in round numbers, 1,000 feet, an area of 10 acres is enclosed without exceeding the permissible length of side. In the case of the trapezium, as in that of the rectangle, the perimeter is the deciding factor; this is at a minimum when the length of the side equals the mean between the top and base,

and for the required area the dimensions will be, base 1,065 feet, top 355 feet, and sides each 710 feet. It is difficult to determine the most economical proportions for the segmental form. The more nearly it approaches a complete circle, the greater will be the economy in the length of the boundary road; but, on the other hand, the internal space is more difficult to develop, and, with the smaller radius required to enclose the specified area, the disadvantages of tapering plots and the additional loss between the blocks of houses inherent in the circular form, are intensified. Moreover, where complete circles are used, they almost invariably occupy the center of a scheme of roads based upon the spider's web, and, for convenience of traffic, are divided into sectors by the principal roads. This is also generally true of all segments greater than a semi-circle, so that we may reasonably confine our attention to segments equal to or less than a semi-circle; of these, the semi-circle is from every point of view the most economical form; a diameter of 1,052 feet will give the requisite area.

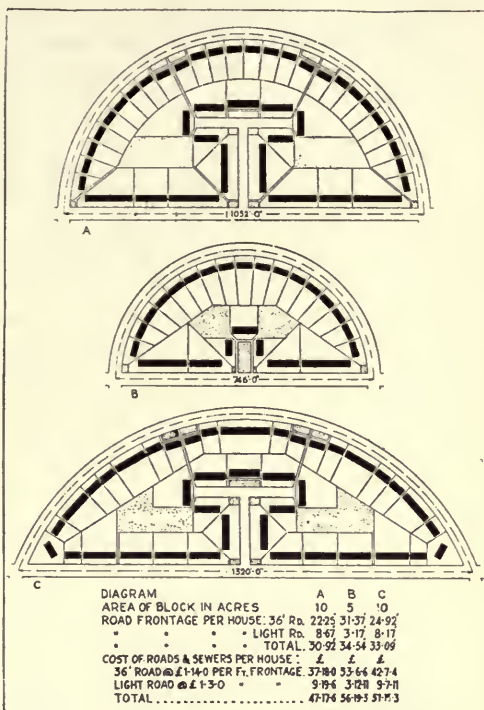


FIG. 11. COMPARATIVE COST OF DEVELOPMENT FOR SEGMENTAL BLOCKS OF DIFFERENT SIZES AND SHAPES

The dimensions of these typical shapes have been worked out in some detail in order to ascertain the most economical form in each case. These data will be a most useful guide in the determination of the general layout of the minor roads, but it is not, of course, suggested that the objects of estate development will be achieved by the adoption of certain standard geometrical figures. There are always some local considerations which influence the layout in a particular direction, but, at the same time, in any plan for a reasonably flat site, the roads must inevitably cut up the land into blocks corresponding to one or other of the typical shapes we have been considering, and it is useful, therefore, to have certain standards which are known to be the most economical in their class and to which, accordingly, it is desirable to approximate as closely as the exigencies of the particular case allow. There will, however, be many instances where anything like a close approximation is not practicable. In the rectangular and trapezoidal figures, especially, there is likely to be considerable divergence between the practical and

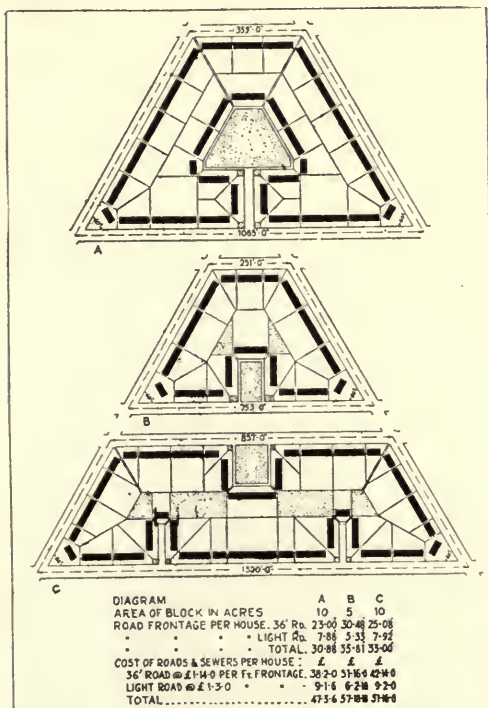


FIG. 10. COMPARATIVE COST OF DEVELOPMENT FOR TRAPEZOIDAL BLOCKS OF DIFFERENT SIZES AND SHAPES

theoretical proportions, and in such cases it becomes essential to consider the effect upon the shape of the block, of the size and shape of the house plot.

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Municipal Dam Helps Village Development

THE acquisition of a power site on the St. Joseph River and the construction of a municipal dam are two factors that have helped to raise Sturgis, Mich., from the rank of a quiet, obscure village to that of one of the leading small industrial cities in the state.

A number of years ago, when the possibilities of a municipal dam for Sturgis were first realized, Frank W. Wait, now Mayor of the city, secured an option on a power site and dam six miles west of Sturgis and turned it over to the municipality. A plan was then put before the City Council for the purchase of the site. Before any action could be taken, however, it was necessary that flowage rights be obtained, and to meet this contingency the embodying in the new state constitution of a clause, giving municipalities the right to condemn land for flowage, was secured. Certain power companies made strenuous efforts to frustrate the project, and numerous minor obstacles had to be faced, but the purchase was finally made by the city. A new dam, 300 feet wide, developing 1,500 horse-power, with a connecting power-plant, was then constructed at a cost of \$215,000. The plant

is now in successful operation and is proving a source of considerable income for the city.

Since the completion of the dam, fourteen industries, attracted by the low power rates, have located in Sturgis, and the population of the city has increased from 3,000 to nearly 8,000. Three years ago the commission form of government was adopted, and since that time the city's tax rate has dropped from $9\frac{1}{2}$ mills to $4\frac{1}{2}$ mills, which is believed to be lower than that of any other city in the state. An additional tax of $1\frac{3}{5}$ mills will be levied this year to provide for the operating expenses of a \$100,000 hospital now being built, and to pay the interest on the bonds used for the construction of the building.

The city now has sixteen miles of paved streets and thirty miles of sidewalks; its water and electric light plants are municipally owned, and its bank deposits are well over \$2,000,000. During the past year a \$12,500 fire engine was purchased, a \$16,000 Gamewell fire-alarm system established, and a \$7,000 Kelly well installed—all of which were paid for in cash out of the city's general funds.



THE MUNICIPAL DAM, STURGIS, MICH.

Cooperation with Latin-American Municipalities

By L. S. Rowe

Director General, Pan American Union

IN the recent political development of the countries of Latin America, there is growing appreciation of the importance of strengthening municipal organizations and activities. They appreciate, as we appreciate, the fact that the daily life, the standard of comfort and, in fact, the social and economic development of a country are affected much more closely by the character and efficiency of its municipal institutions than by any other factor in national life. The recent improvements in municipal organization in the United States have aroused much interest throughout Latin America and have given rise to a no marked desire for a well-organized interchange of experience, in order that every municipality on the American Continent may benefit by the experience of its sister cities.

Unless I am much mistaken, there is a wide-spread feeling in the United States that our municipal experience carries with it many lessons to Latin America, but that

we have little to learn from Latin-American cities. This is far from being the case. From the point of view of what may be called the social and artistic activities of organized government, the Latin-American cities have much to teach us, for they have never permitted the haphazard building development which has characterized our American cities. In the matter of civic planning, the laying out of parks, the construction of public buildings and the beautifying of water-fronts, the larger cities of Latin America are far in advance of most of our American communities.

The extension of the sphere of action of the National Municipal League so as to include Pan American cooperation in the solution of municipal problems will constitute a real forward step in the development of closer relations between the republics of the American Continent. The recent International Conference of American States, usually referred to as the Pan American Conference, which assembled at Santiago,



PHAROUX PASSENGER LANDING AT RIO DE JANEIRO, BRAZIL



WHARF AT CALLAO, PERU

Chile, in March last, recognized the importance of this movement by adopting a resolution recommending that the governments of the American Continent facilitate in every possible way the establishment of closer ties between the municipalities of North, Central and South America and that they foster the interchange of data and ex-

perience, in order that each municipality may profit by the successes as well as by the failures of its sister cities.

ACKNOWLEDGMENT.—Abstract of an address delivered before the recent joint session in Washington of the National Municipal League and Governmental Research Conference. An illustrated pamphlet on the Ports and Harbors of South America may be secured from the Pan American Union, Washington, D. C., on application.

Insurance Rates—an Individual and Community Responsibility

ACCORDING to the degree of efficiency of water-works or other fire-extinguishing agency, and of the fire department, its men and equipment, each city or village is given a certain basis rate of insurance. Whether that basis rate be favorable or not depends on the municipality and its attitude on fire protection.

Beyond this, each individual insurer is largely responsible personally for the rate he pays. Every fire hazard he harbors and tolerates within his building and every exposure from without add to this basis rate. He is solely responsible for fire hazards within his building, and he can at least protect himself against exposure hazards.

If the individual is complacently satisfied with unclean conditions within his building, with defective electric wiring, poorly installed heating plants, defective chimneys, poor shingle roofs and other well-known hazards, and with entire lack of even the simplest kind of fire protection, he must pay for his neglect by increased rates.

It may be argued that the individual is not responsible for his surroundings and exposures. In part that is true, but he can at least use his influence to have vacant, old, dilapidated fire-traps near him condemned, thus adding to the safety, attractiveness and health of the community. With the help of the fire department he can get the careless neighbor to clean up his yard and alleys and so remove fire breeders and fire spreaders. In all cases he can protect him-

self against exposures by installing wire-glass windows in metal sash and frame, fire-shutters and fire-doors and fire-resisting roof coverings in place of dangerous wooden shingles. All such improvements are reflected in a more favorable rate of insurance. Every man can equip his place of business with simple, first-aid fire-extinguishing equipment, such as approved fire extinguishers, water barrels and pails and interior stand-pipes with hose connections. Where large values are involved, he can install the automatic sprinkler system, the best known protection of both life and property. The concession in rates for such an approved system will in a few years pay for the installation.

American insurance rates are high, much higher than in European countries; and appreciable reductions in rates can only come with a decrease in American fire losses. Municipalities must strengthen their fire-fighting means, that the losses per fire may be kept at the lowest possible mark, and every citizen and property owner must work to eliminate conditions which cause fires, or which cause fires to spread.

What is your community doing, and what are you doing individually to reduce fires and fire insurance rates?

Rates must always be sufficient to pay for all fire losses and for the expenses of conducting the insurance business.

—From a Bulletin issued November 15, 1923, by the Industrial Commission of Wisconsin.

New Street-Lighting System Enhances Beauty of Street

By D. R. Snider

Superintendent, Municipal Electrical Department, Augusta, Ga.

GREEN STREET, which is considered one of the most beautiful residential streets in Augusta, Ga., has been made still more attractive by the installation of a new street-lighting system. This thoroughfare is about 2 miles long and has a green 41 feet wide in the center, on each side of which is a 42-foot driveway and a 10-foot sidewalk.

The new lighting system consists of 76

single conductor is laid next to the curb along one side of the green, looping across to each post, and is about 18 inches below the surface of the ground. In crossing intersections or paved cross-streets, 3-inch creosoted ducts were laid. In making the installation, the street was crossed at the end of each circuit and the cable was laid down one of the side or cross-streets so that it would not show on Green Street. The



A VIEW OF GREEN STREET, AUGUSTA, GA., SHOWING NEW STREET-LIGHTING STANDARDS AND ALSO THE TALL WOODEN POLES WHICH ARE TO BE REMOVED SHORTLY

French design King posts equipped with Novalux ornamental lighting units, placed alternately on the outer sides of the green at intervals of 270 feet, which is equivalent to one standard and lighting unit for each 135 feet of street frontage. Two posts are placed at each street intersection, and all posts are installed on foundations 24 inches square.

The system is divided into five circuits with an RO transformer with 2,300-volt primaries and is equipped with a time-clock. The secondary is a 7.5-ampere series circuit. The 2,300-volt, rubber-parkway, No. 8,

system is grounded at every post with a $\frac{5}{8}$ -inch copper-clad ground rod.

All the units are equipped with 400-candle-power lamps, which give the desired amount of light. The street is heavily shaded by numerous large trees, and it would have taken many overhead lights at \$1.50 more per light to illuminate it than by the present system, which cost \$10,500. The overhead wires which now run down the central parkway or green on high wooden poles are to be removed, thus adding materially to the present already attractive appearance of the street.

Water Meters in Chicago

ACCORDING to the Forty-Seventh Annual Report of the Chicago Department of Public Works, for the year ending December 31, 1922, 1,545 new meters were in-

stalled, of which number 74 replaced smaller services. The total number of meters in service on December 31, 1922, was 32,034. The average cost of maintenance was \$4.18.

All "Beat" and No Play

By C. A. Crosser

Secretary, Commission of Publicity and Efficiency, Toledo, Ohio

ALL "beat" and no play makes Jack Policeman a dull officer.

Inauguration of police recreational programs has come about because of a number of reasons. It has become more apparent that municipal police service must be made more attractive to obtain recruits. It is obvious that young men are not likely to be induced to enter a service which pays only from \$125 to \$150 a month, when they can get as high as \$225 monthly in the skilled trades.

For this reason the policeman's vocation must be lifted out of the category of the trades, and enhanced with some of the attractive aspects of college or a high type of military service, to compensate for the low remuneration.

Another thing which reacts against the attractiveness of police work is the increased personal risk. The possibility of injury or death in the policeman's calling is far greater now than it was a score of years ago. The daily papers bear this out in the frequent items recounting the death of an officer of the law at the hands of daring robbers or other law-breakers.

Reports from 48 Cities

Chiefs of police of 48 cities in the United States and Canada replied to the questionnaire sent out by the National Committee on Police Welfare. The liberality of Canadian cities, including Hamilton, Ont., Toronto, Vancouver, Winnipeg and Ottawa, with respect to police recreation, is especially brought out in the replies.

Inauguration of athletics in police departments in some of the cities has come within the last six years and may be traced to the success of organized recreation pro-

grams in the cantonments during the World War. On the other hand, athletics have been a recognized feature in the police departments of a few of the larger cities for a number of years; for example, Toronto police athletics date from 1893. Organized athletics have been in existence in the New York Police Department for a great many years, and some of the metropolitan police track athletes have made great names for themselves in the world of sport.

Athletic activities are carried on both during working hours and off duty, in Chicago, Toledo, Worcester, Ottawa, Can., Trenton, N. J., Salt Lake City, Omaha, Detroit, Paterson, N. J., Washington, D. C., and San Francisco. In 16 other cities all recreation is had

off duty. The different reporting officials, including chiefs and superintendents of police, expressed a diversity of views as to whether organized recreation should be engaged in on or off duty. Eighteen asserted that it should be off duty; ten, on duty; and four that it should be required both on the men's regular time and when off duty.

Organized Recreation for Police and Fire Departments

To ascertain the extent of the movement for organized recreation for the men, which has been spreading among the police and fire departments of the United States in recent years, the National Committee on Police Welfare has secured, at the request of the Toledo Commission of Publicity and Efficiency, the information on which the accompanying article is based. It appeared originally in the Toledo City Journal for December 22 and 29, 1923.

Indoor and Outdoor Athletics

In 19 cities either the police departments have their own gymnasiums or gymnasium facilities are available.

Almost all the American cities reported having police baseball teams. A lesser number also have basketball, football and track teams. A number of others offer all-around gymnasium work. In a few cities, including Jersey City; Fargo, N. D.; Dallas, Tex.; Bridgeport, Conn.; Pittsburgh and Reno, Nev., members of the police force do not participate in any form of organized

recreation under department supervision.

The following have police baseball or football teams: Scranton, Trenton, Boston, Hamilton, Salt Lake City, Mobile, Toledo, Omaha, Toronto, Norfolk, Akron, Springfield, Mass., Detroit, Seattle, Winnipeg, New Haven, Paterson, Fall River, Des Moines, Minneapolis, Manchester, N. H., Louisville, Washington, Ottawa, San Francisco, and New York. A smaller number have track teams.

Eleven departments provide instruction in boxing and wrestling.

Annual police or police and fire field days are held in Buffalo, Chicago, Detroit, New York, Akron, St. Louis (circus), Trenton, Jersey City (intermittently), Hamilton, Toledo, Toronto, Norfolk, Vancouver, Seattle, Winnipeg, Pittsburgh, New Haven, Worcester, Fall

Oakland, music and field days; Providence, new gymnasium; Norfolk, drum and bugle corps; Toledo, gymnasium; Columbus, track team; Cleveland, band concerts in public parks; Louisville and Toronto, field days and music features.

Endorsement of police recreation as shown by the results is given by 23 heads of police departments. Only 6 assert that recreational features are not particularly justified.

There are police athletic clubs in the following cities: Hamilton, Norfolk, Toledo, Omaha, Toronto, Grand Rapids, Mobile, Vancouver, Seattle, Winnipeg, New Haven,



"PAVEMENT POUNDING" MAY MAKE FLAT FEET, BUT THIS DID NOT STOP THE TOLEDO PATROLMEN FROM WINNING THE HALF-MILE RACE FROM THE FIREMEN IN THE 1923 TOLEDO POLICE-FIRE FIELD MEET



THE TOLEDO POLICE "HUSKIES" WINNING THE TUG-OF-WAR OVER THE FIREMEN IN THE 1923 FIELD DAY.

Manchester, Ottawa and New York.

Police bands or orchestras have been organized in the following cities: Los Angeles, St. Louis, Jersey City, Boston, Salt Lake City, De-

troit, Vancouver, Seattle, Winnipeg, Minneapolis, Louisville, Cleveland, New York and Chicago. There are glee clubs or quartets in Los Angeles, St. Louis, Portland, Seattle, New Haven, San Francisco, New York and Chicago.

Thirty-eight departments have regular pistol practice, while ten make no provisions for this activity. Military drill is required in 31 cities.

Recreation Program of the Toledo Police Department

The recreational program in the Toledo Police Department, inaugurated by Chief of Police Harry Jennings, includes base-

Increased Recreation Facilities Planned

An increase in the scope of recreational facilities is planned in the following cities:

ball, football, track, basketball, bowling and pistol teams. All of these police athletic aggregations have made creditable records for themselves in the realm of local sport.

A Police and Firemen's Field Meet was held last summer.

A recently organized police orchestra has been favorably received at several performances.

Chief Jennings says that about 25 per cent of his men have participated in these different recreational activities. While this percentage is not as large as could be desired, yet every man on the force has the opportunity of participating in them, the Chief says.

The development of pistol teams will be materially encouraged by the completion of

the new pistol range at Bay View Park, said to be one of the finest in the country.

The Chief also hopes to make an arrangement with the University of Toledo which will enable members of the force to take courses in criminal law, rhetoric and other studies which will assist the officer in his work.

Much of this recreation is done on regular time. The Chief and the Safety Director believe that this is proper, inasmuch as athletics and marksmanship contribute vitally to the development of a first-class policeman. It is pointed out that organized recreation is considered an established phase of the military and navy curriculum and therefore would have a similar application to the police department, which is a semi-military organization.

Fourth-Class City--First-Class Ideas

By Earl M. LaPlant

President, Door County Chamber of Commerce, Sturgeon Bay, Wis.

WITHIN a period of less than a year—since the election of our present Mayor—there have been added to the municipal improvements of Sturgeon Bay two miles of sewers; a complete system of artesian water, with supply tank for fire protection; a park at the end of Main Street with fountain, comfort station and band-stand; and a municipal playground 330 by 250 feet, electrically lighted, with a 300-foot retaining wall, used also for a skating-rink in the winter. For the comfort of the children there has been placed at the extreme end of the skating-rink a warming-house with city heat, such as we believe is not to be found elsewhere in the state of Wisconsin.

All these improvements for adults and children have been made at a cost of about

\$5,000, every cent of which has been raised in small donations from the public. There has also been brought to completion a Main Street White Way, on which work had been done before. Every telephone and telegraph pole has been placed in the alley-ways, and on Main Street granite lighting posts with 400-watt lamps have been installed. The Westinghouse Electric & Manufacturing Company furnished the electrical equipment, and the standards were manufactured by the Massey Concrete Products Corporation, of Chicago. One-half of the installation cost has been paid by the city, and the rest by the property owners.

Our Mayor, James G. Martin, under whose leadership this work has been done, is manager of the largest sour cherry orchard in the world, three miles from



THE MUNICIPAL SKATING-RINK IN STURGEON BAY, WIS., IS ALSO USED AS A CHILDREN'S PLAYGROUND IN SUMMER



MAIN STREET, STURGEON BAY, WIS., BEFORE IMPROVEMENTS

Note the unsightly telegraph and telephone poles on both sides of the street



MAIN STREET, STURGEON BAY, AFTER THE INSTALLATION OF THE WHITE WAY

The poles have been removed to alley-ways and granite lighting standards have been erected

Sturgeon Bay. For his work for the city he receives the munificent salary of \$450 a year. His first salary was turned over to the Police Department for uniforms. By his unselfish spirit and ability as a leader, he has created a movement throughout the city to improve its beauty, and has brought about an unusual unity of ambition among the citizens for the betterment of the community. The Mayor is fortunate in having with him a Council that is just as progressive in its ways as he is in his. Indeed, every officer of the city is trying to make

Sturgeon Bay one of the finest places in the state to live in.

As an example of the cooperation shown, the warming-house for the children on the playground is moved to the center of the town for the summer and is used for the Chamber of Commerce office. The organization is an active one and has a paid secretary. The city officials have the cooperation also of the Rotary Club, and, in fact, of all the organizations of the city. We are proud of the fact that Sturgeon Bay is a fourth-class city with first-class ideas.

Editors of Newspapers and Bulletins

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Thinking Ahead for the Relief of Street Traffic Congestion

What an Adequate Fact-Finding Survey of Local Traffic Conditions Should Cover

By J. Rowland Bibbins

Consulting Engineer, Washington, D. C.

IN "The Battle of the Streets," in THE AMERICAN CITY for October, 1923, the writer outlined some important elements of the so-called "traffic problem," covering not only street-traffic control, but also transit operations, street and highway systems, commercial vehicle and freight trucking, the railroad terminal system, and the relation of each to the broad city and district plan. From this analysis, it seemed clear that we have aimed entirely too low in our expedient methods of handling "the problem," which have not brought results adequate to present needs, to say nothing of the future. It is now clear that every city should be hard at work upon a more fundamental traffic-transportation plan, at the bottom of which lies the need for fact-finding in a broad sense.

Such a transportation plan, adequate to a growing city's needs, cannot be evolved over night from the inner consciousness of a group of busy business men trying to match their ideas upon a set of standardized conclusions collected from various other cities, where conditions may be entirely different. Every situation is a law unto itself, and the only way to secure an adequate basis for intelligent action is to determine the underlying facts first by a proper technical survey of the local conditions. Then an adequate program can be developed in three stages suited to the needs and resources of the community:

1. For the present time at minimum cost
2. For the near future, at moderate cost
3. For ultimate development

What Should a Survey Cover?

The transportation survey authorized by the Massachusetts State Legislature for Boston and its 42 surrounding communities covers broadly the principal elements. But the specific studies necessary in any given location vary widely in character. Some of the more important studies were presented by the writer in testimony before the U. S. Senate Committee on Traffic Conditions in the District of Columbia, largely included in the report of that committee dated January 22, 1924. To quote in part:

"This survey should determine at the outset the most

The Primary Key to City Development

The transportation plan must be recognized as the primary key to proper city development, not the football of politics or of commercial exploitation. Upon its effectiveness every citizen and every legitimate business, particularly the local transit system, whether by trolley or bus, is inevitably dependent. The plan should be coordinated with, and not subordinated to, other phases of the city plan. It is not a detail to be passed over with an elusive brush. It is fundamental to a city's life. But there is every reason, nevertheless, to conserve to the maximum the esthetic and spiritual values of a properly conceived city plan.

important physical conditions and facts, such as:

- The totalized movement of traffic in and out of and through the congested district
- Relative capacity of the key street crossings
- Efficiency of various traffic signal methods
- Efficiency of use of one-way and two-way streets
- Means of distributing traffic concentration
- Means of segregating traffic and transit streets
- Density and parking time prevailing, with the proportion of violation
- Average parking time and facilities required for short-time parking, as distinct from long-time parking or day

storage

Analysis and interpretation of the record of traffic accidents and of the effectiveness of the present system of correcting traffic violations

"The survey should also appraise the relative value of present traffic streets and *facilities and future needs*, such as:

The limiting of roadway widths and obstructions

The reconditioning of streets as to paving and continuity

Development of cross-town and by-pass streets to relieve the central district

Relative roadway capacity and distribution, in-bound and out-bound

Best ways and means of carrying out street widenings most economically and with least destruction to the valuable trees shading our roadways

Centers of gravity of present developed building floor space convenient to the delivery district

Grade crossing, bridges and other throat obstructions

Study of commercial trucking, origin-destination and best methods of routing, loading and dispatching to relieve central congestion

Possibilities of improving store-door delivery and avoiding street obstructions during new building operations

Possibilities of appropriate development of sub-sidewalk space

Means of facilitating pedestrian movement

"This survey should incorporate, so far as possible, studies for:

Simplifying street-car routing and operation

Decreasing transit time through the delivery district by reducing track interferences

Increasing street-car loading speed and operation throughout the system

"And, finally, the survey should develop the trends and *tendencies* in the growth and density of settlement throughout the whole metropolitan area:

The probable future development and distribution

Where future transit will most likely be concentrated

Probable new traffic routes and throats

Best relation of this traffic street system to the tributary highways leading into the District

Probable needs of the rapidly expanding business district

A scientific forecast of the future population, transit and motor traffic, commercial freight tonnage, etc., for which the city should now be in preparation

"An important study related to the survey which should be carried out simultane-

ously is, *Where is the money coming from* and how fast can improvements go on?—

An analysis of the present and future funding power of the city, based upon its assessed property value and all other sources of revenue

The proper allocation of this revenue for transportation and traffic purposes, with the proximate cost and maintenance of projects recommended

The allocation in the annual budget therefor to (a) traffic, (b) property benefited, and (c) the general public

In other words, to apply the balanced-budget for traffic and transportation purposes

"*The legal aspects* of the traffic situation constitute a separate question, part of which, such as a traffic court and impounding law, can be acted upon promptly, independent of the physical survey while it is under way.

"The development of a *new model code of traffic regulations* should wait upon such an engineering survey as has been suggested, for the present codes are in the main good ones."

The Objects of This Plan of Survey for Any City Will Now Be Clear

1. An adequate thoroughfare plan, with scientific classification of streets and design of roadways, paving and operations for the traffic they are carrying or may reasonably be expected to carry.

2. A scientific traffic organization and control system, based upon ascertained traffic needs, rather than opinion, predilection, fancy or experiment. This includes prominently the improved handling and routing of commercial vehicle and trucking movement, and cartage control, which is a much larger part of the problem than is generally realized.

3. A plan of transit routing, operation and service, adjusted to the traffic and civic needs of the community on the principle that maximum speed and convenience and adequate service are paramount and that the American public will finally support the best service it can secure.

4. A railroad terminal plan which will avoid the vast expenditures now needlessly wasted in the congested districts and avoid adding to the passenger congestion by needless intra-city or cross-town freight trucking collection and delivery now surging through passenger thoroughfares.

5. The best relation of all these elements to the whole city plan and to the general public welfare, without which any city plan must be seriously defective or even abortive.

What should be the program of action?

The following steps are essential:

1. Schedule and budget a definite street

reconditioning program for five years ahead, to develop reasonably soon on the essential arteries and by-pass streets the full roadway capacity needed.

2. Plan now for a city of double the present size, without stopping to quarrel at just what date that event will take place. It will be sure to come too soon.

3. Entrust this transportation plan to technical leadership, or to a commission whose personnel embraces the special qualifications and experience appropriate to the difficulty of the task.

4. Provide ample funds for field and staff work. Such an enterprise is worthy

of more than niggardly financing. The work will be largely without precedent and will return infinite dividends to the community.

5. Organize a competent local civilian body to consider this plan and subject it to constructive criticism and furnish the powerful support which such a body can give. This is its proper function, not the original development of the plan itself.

6. Make transportation, above all, a continuing development, linked in with the public works program and considered in the same category with construction and finance.

To Keep Street Areas at Crossings Free from Standing Vehicles

To the Editor of THE AMERICAN CITY:

Some of your readers may be glad to contribute their ideas as to a practical method of relieving traffic congestion at the place where the chief difficulty usually comes—at street crossings or junctions. In a developing area, for example, stores, garages and filling stations are generally located at crossroads. The area at the junction has to do double duty to begin with; then every car or team that stops adds still further to the difficulty.

The value of setback lines is often entirely lost because without such lines the street or road will carry all the traffic that can be cleared at the junctions. How can this double-duty area at street crossings be kept free from standing vehicles?

I have worked out one solution whereby the corner properties take care of their service trucks and cars of customers inside the building line. I presented the problem to J. Henry Duffy, Town Engineer of Lexington, Mass., and he has added a protective feature in the shape of a small island at each corner. The accompanying plan shows an actual illustration of how it would work, prepared by Mr. Duffy for the junction of Waltham Street and the State Road, Lexington.

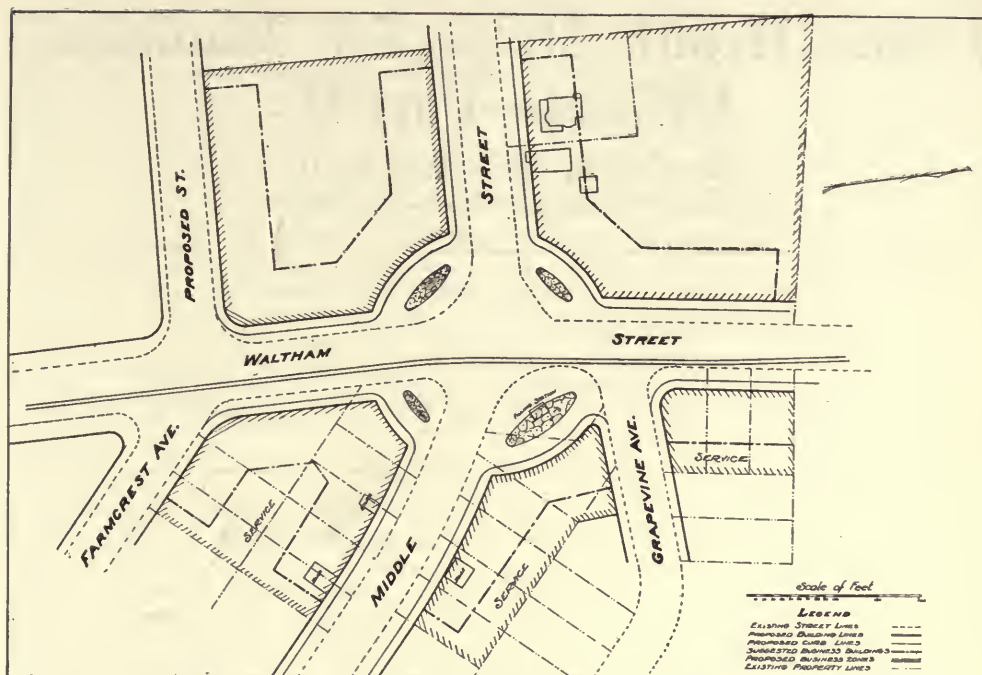
Horace B. Gale, of Natick, President of the Massachusetts Federation of Planning Boards, suggests another plan, consolidating the islands at the center, thus forcing through-traffic to slow down and probably

avoiding the need of a traffic officer. Opposed to this is the suggestion that the central island would make night driving dangerous. The island would be lighted and, while possibly dangerous to reckless drivers, would probably add to the safety of others.

The thing cannot be done by any rule, a circle with a certain radius, or any similar device, because streets come together at all angles and with all sorts of curves. An adaptation of the idea must be worked out for each situation. If the principle could be tied up with zoning, a drawing of each problem to scale being made a part of the local zoning law, it would save an enormous expense for ultimate widenings, with the resultant destruction of property. The application of the principle would be for the safety, comfort and general welfare of the people. Is there any reason why it could not be done under the police power?

In considering the problem, it should be remembered that a street should be like a water pipe—able to discharge all it can take in. If one wants to carry water from one place to another, there is no good in providing an 8-inch main for the entire distance and putting in a 4-inch gate at some point for shut-off purposes. An 8-inch gate must be provided. Should we not do the same with our streets?

The following section, or something like it, in a zoning ordinance would meet the



PLAN FOR JUNCTION OF WALTHAM STREET AND STATE ROAD, LEXINGTON, MASS.
Showing small island proposed for each corner

need if it can be worked out in this way:

"Street Corners in Business Districts.—To promote safety and convenience and to prevent congestion and traffic hazards, the treatment of corners in business districts, as shown on the zoning map at the intersection of important streets, shall be as shown on detailed plans prepared by J. Henry Duffy, Town Engineer, signed by the Planning Board and dated. . . , 1924. These detailed plans, filed with

the zoning map, are hereby made a part of this by-law."

This problem is worth some effort. Will not those interested help to work it out?

EDWARD T. HARTMAN,
State Consultant on Housing and Town Planning.

37 State House, Boston, Mass.
January 14, 1924.

Watch Your Asphalt Specifications

APPARENTLY some highway officials and consulting engineers have not fully realized that, beginning January 1, 1924, manufacturers, in accordance with the recommendations adopted at the Asphalt Paving Conference held by the Department of Commerce, are making asphalt of only nine definite penetration limits for the construction of sheet asphalt, asphaltic concrete and asphalt macadam pavement and for surface treatments, and four penetration limits for joint fillers and various other types of construction, including brick and granite block pavements.

Highway engineers of thirty states, the American Society for Testing Materials, the American Society for Municipal Improvements,

the American Society of Civil Engineers, the U. S. Bureau of Public Roads, the Asphalt Association, and five non-members of that association, have officially accepted the standards mentioned.

Engineers and street and highway officials in some instances are still specifying other than the thirteen definite limits which have been set. In this way they are increasing the price which the manufacturer must charge for the special asphalt, because the refining processes and storage of asphalt are now standardized for the grades agreed upon. Further information may be secured from any of the asphalt companies, the Asphalt Association, or the Department of Commerce, Washington, D. C.

Public Health Helps for Municipal Officials--Part II

By Carl E. McCombs, M. D.

National Institute of Public Administration

EDITORIAL NOTE.—*Dr. McCombs classifies health department functions into five main divisions. The first two—prevention of communicable diseases, and child hygiene—were discussed in Part I of this article. In the second instalment, which concludes the article, he discusses the other three functions—food sanitation, general sanitation, and keeping of vital statistics. The small figures found throughout the text refer to the list of selected references at the end of the article.*

Food Sanitation

THE question of milk standards is one that appears to be a favorite subject of municipal controversy. As the result, we have throughout the country the widest possible variation in milk regulations. There are, of course, other factors than health to be considered in the regulation of the milk supply. It is conceivable that standards might be set so high that producers would be forced out of business, with a resulting milk shortage, or would be compelled to charge such a high rate for their product that the people most needing milk for food would be compelled to go without it. But is it perfectly possible to have a thoroughly sanitary milk supply without imposing impossible conditions upon producers or consumers. For many years a commission on milk standards appointed by the New York Milk Committee has been at work developing milk standards suited to the health and economic requirements of American communities.⁽¹⁰⁾ A joint committee representing the New York State Health Department and the New York State Conference of Mayors and Other City Officials has also recently prepared a model milk ordinance, which in its essentials follows the recommendations of the commission on milk standards.⁽¹¹⁾ This code will be found extremely useful to any city wishing to revamp its own milk regulations.

With respect to the inspection of food other than milk, the essential thing is to see to it that food, particularly meat, is not contaminated with disease-producing organisms anywhere in its route from pro-

ducer to consumer. Cattle may be infected with disease organisms prior to slaughter, and in the majority of instances such infection is tuberculosis. Inspection of animals at slaughter by a competent veterinarian is the only method of excluding infected meat. Once it has reached the retail stores, inspection is of very little value. In a city deriving its meat supply from sources outside the state, the meat bears the stamp of inspection by Federal authorities, an inspection that is generally recognized as competent. If produced and slaughtered within the state, it may not have been inspected at slaughter. The city need concern itself therefore only with the latter supply. For inspection of such supply, the standards of the Federal Bureau of Animal Industry should be the guide. In general, it may be said that cattle slaughtered on local farms, that is, "country killed" meat, is more likely to be disease-infected than that which passes through a public abattoir, for the reason that the average small farmer does not take as great care to protect the health of his cattle as does the large cattle grower.

Other chief sources of food contamination to be watched are flies and food handlers. Flies can be eliminated by proper disposal of wastes and screening. To protect food against disease contamination from food handlers requires their proper physical examination and the exclusion from the food-handling business of persons infected with communicable disease. This procedure is gradually gaining ground in progressive city health departments, and the results of such examinations have dem-

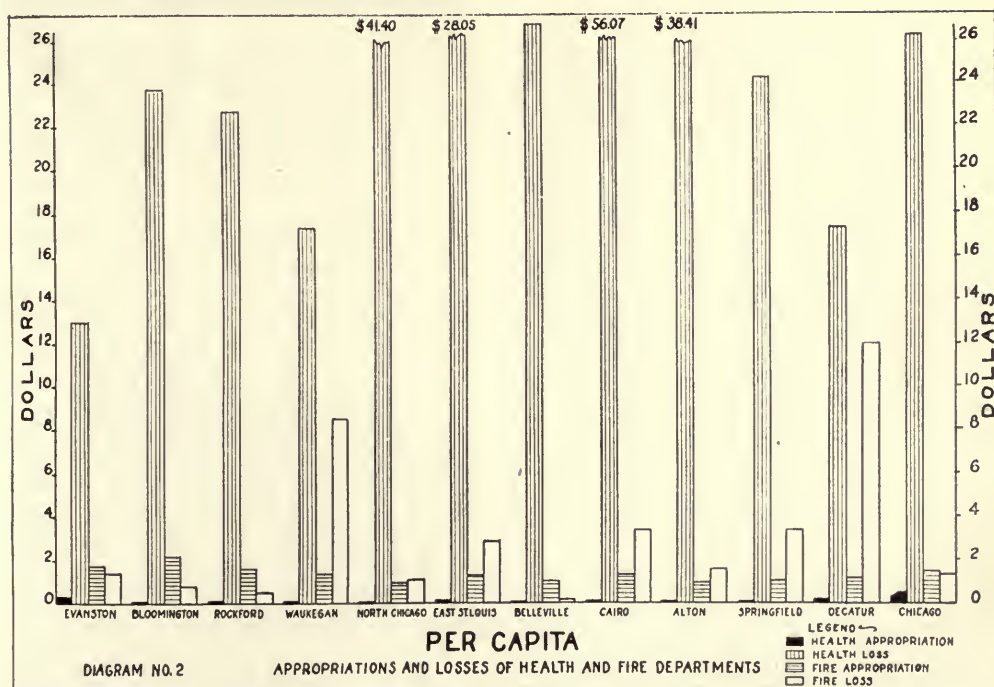
onstrated that it is a worth-while procedure. Physical examination of food handlers and the refusal of permits to those found with communicable disease is an established procedure in New York City, Newark and many other cities. Reference is made to a monograph on The Health of Food Handlers, published by the New York City Health Department, and a report on The Examination of Food Handlers, by the Newark, N. J., Health Department.⁽¹²⁾

For routine sanitary inspection of food stores a scoring system is needed that will permit concentration of inspection where it is most needed. There should be, first, a general survey of all establishments, classified according to the nature of their business. On the basis of this preliminary survey, inspection should be directed to those groups of establishments where conditions are most unsatisfactory from the health view-point. All should be scored and a certificate of rating issued to each. Inspection should then be centered on those having lowest scores. By this method of inspection, coupled with the issuance of certificates of grade, it should be possible to eliminate from routine inspection those establishments which have a high rating.

As the rating of those places scoring low is raised through inspection, the necessity for routine inspection should become less and less, provided all establishments are licensed annually and licenses granted only upon evidence of satisfactory sanitary conditions. More detailed comment by the writer on food inspection methods is included among the references at the end of this article.⁽¹³⁾

General Sanitation

With respect to general sanitary inspection—what is ordinarily known as nuisance inspection—there is little to say. Much of the work now done by the sanitary inspectors of a municipal health department could be and should be done by the police, since it is more often a matter of good policing than health control. It is important, however, in the interest of citizen cooperation, to see that nuisance complaints are properly attended to by someone and that there is a complete record of the circumstances in each case. By properly registering and classifying nuisance complaints, extremely valuable information regarding local conditions can be obtained by the health officer. Anonymous complaints

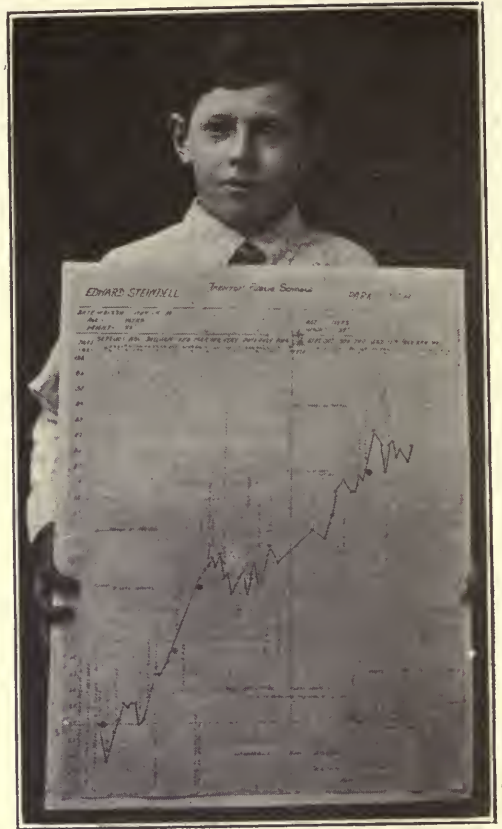


A CHART REPRODUCED FROM "ECONOMICS OF HEALTH ADMINISTRATION," BY HENRY BIXBY HEMENWAY, M.D., DISTRICT HEALTH OFFICER, SPRINGFIELD, ILL.

are frequently ignored by health authorities, but this is a mistaken policy. Many times important information is received through anonymous complaints. Citizens should be encouraged—and not discouraged—to complain. The citizen who makes a reasonable complaint and gets prompt action on it from his government invariably feels good about it, and he is likely to appraise his government's efficiency in direct proportion to the attention it gives to his personal needs, regardless of questions of public benefit.

One great difficulty in developing a rational program of health administration in many cities is that local ordinances and regulations are the patchwork result of several years of special enactment, influenced variously at different periods by changing conditions of community life and changing political régimes. Many times it is extremely difficult for the investigator to determine what the responsibilities of a health department are, because a complete set of ordinances and regulations cannot be found. Perhaps they were printed in local papers of which no files were kept; perhaps only typed copies were made and these have been lost; perhaps they were printed in the proceedings of the city council or other legislative body and have to be hunted for most assiduously without the aid of a satisfactory index. Many times ordinances are found that contradict other ordinances without repealing them; many times local ordinances are passed that have not the support of the general public health laws of the state; many times local regulations are still considered to be in force when they have in fact been repealed. Even when all ordinances and rules and regulations have been gathered together it is well nigh impossible to lay out from them a program that will conform to their requirements without a most uneconomic expenditure of funds.

The city that hasn't a well-developed, properly correlated code of ordinances and regulations based on the public health law of the state and upon modern approved practise in health administration, ought, before it prepares its next budget, to find out what health responsibilities it has and proposes to assume, and enact a health code that will provide for their satisfactory administration. Such a health code is a vital necessity to the health officer for the



A STUDY MADE IN THE PUBLIC SCHOOLS OF TRENTON, N. J., OF THE REHABILITATION OF A MENTALLY DEFECTIVE CHILD

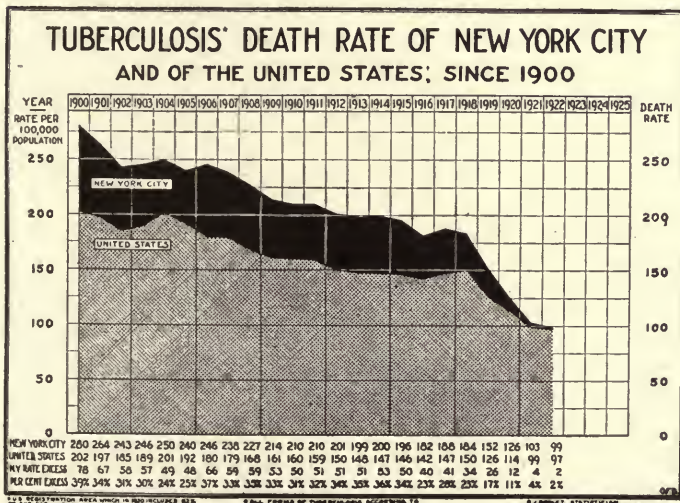
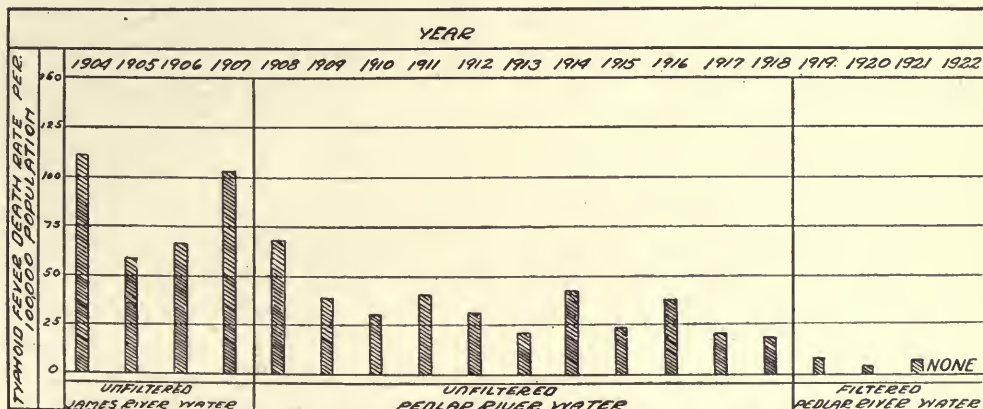
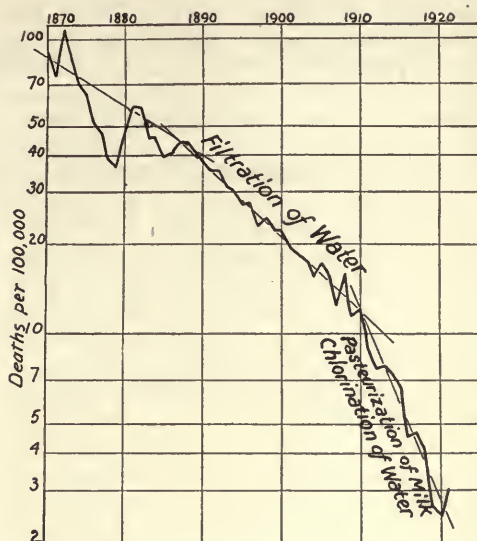
Reproduced from "Growing Healthy Children," published by the U. S. Bureau of Education for the American Child Health Association

direction and training of his subordinates; it is essential also for the information of the police and others who may be called upon to enforce health regulations, and it ought to be a text-book for the use of the citizen whose education as to his own health duties and obligations has been so sadly neglected. To be most effective, any revision of health ordinances and regulations should be done en bloc rather than piecemeal; otherwise issues are likely to be raised and controversies stirred up with respect to minor matters which in considering a single enactment of the code as a whole would be ignored. If a satisfactory unified health code cannot be enacted, then the piecemeal method may be resorted to, but the former method is the method of choice. A model health code for cities covering the basic principles of health organization and control of communicable

diseases has recently been prepared by a special committee on Model Health Legislation of the American Public Health Association.⁽¹⁴⁾ This model code will be found extremely useful to cities that wish to draft a code to meet local requirements.

The Keeping of Vital Statistics

Let us assume that a health program based upon the principles which we have briefly outlined has been developed in a given city; it follows that a thoroughgoing system of vital statistics registration and research ought to be provided by which the results of the program can be measured. It is important that this service, "the book-keeping of health," be placed under the administrative control of the health authority. If it is otherwise administered, as is the case in many cities, it is likely that



THREE GRAPHS SHOWING DIFFERENT METHODS OF PRESENTING VITAL STATISTICS

Upper.—Reduction of typhoid fever death-rates in Massachusetts, from pamphlet on "The Use of Semi-Logarithmic Paper in Plotting Death-Rates," by George C. Whipple, Professor of Sanitary Engineering, Harvard University; and Miss A. D. Hamblen, Statistician, Massachusetts Department of Public Health

Middle.—A chart from the last annual report of the city of Lynchburg, Virginia

Lower.—A graphic method devised by G. J. Drolet, Statistician of the New York Tuberculosis Association, for showing the death-rate for all forms of tuberculosis, according to mortality statistics of the U. S. Census Bureau, for New York City and for the entire registration area of the United States

the technique of registration which has been prescribed as standard by the United States Bureau of the Census will not be carried out thoroughly. It is extremely difficult for the registrar who lacks public health training and intimate knowledge of its aims and methods to appreciate the significance of many apparently unimportant facts about birth and deaths. The health officer is the one person in the community who, having an understanding of the aims of health service and responsibility for the activities carried on, is capable of guaranteeing efficient vital statistics registration.

It is impossible to discuss here the technique of vital statistics work or the uses of vital statistics in public health administration. City officials should, however, be familiar with the accepted standards of practise and should be able to understand and interpret in terms of community health the reports submitted by their health officers. The references given at the end of this article have been selected with these needs in mind.⁽¹⁵⁾

If a city has the good fortune to have as its health executive a competent, full-time progressive health officer on whom it may rely in framing public health policy, it is to be congratulated. If it hasn't such a health executive, the first step in improving health service is to get one. But whether there is a competent full-time executive or not, the city officials should understand the essential elements of a health-producing administrative program. The science of public health administration has, with respect to such a program, passed beyond the experimental stage. Standards of health practice and procedure have been set up which, if adopted, will guarantee results in any community. Certain of the reports embodying these standard health procedures as approved by authoritative bodies of health specialists were referred to at the

end of Part I. Some others are here listed:

- (10) Report of the Commission on Milk Standards of the New York Milk Committee; Reprint No. 634 of Public Health Reports, Government Printing Office, Washington, D. C.
 - (11) Model Milk Ordinance, recommended by a joint committee representing the New York State Conference of Mayors and Other City Officials, New York State Department of Health, Albany, N. Y.
 - (12) The Health of Food Handlers; report prepared by Louis I. Harris, M. D., Director, Bureau of Preventable Diseases, New York City Health Department, and Louis I. Dublin, Ph.D., Statistician, Metropolitan Life Insurance Company; Monograph Series No. 17 of the New York City Health Department. Also The Examination of Food Handlers; report of Charles V. Craster, M. D., Health Officer, Newark, N. J.; Monthly Bulletin of the Newark Department of Health, August, 1922
 - (13) Protection Against Food Contamination, by Carl E. McCombs, M. D., Chief of Division of Health of New York Bureau of Municipal Research; American Journal of Public Health, September, 1918
 - (14) A Model Health Code for Cities; the Report of the Committee on Model Health Legislation of the American Public Health Association; Reprint of the American Public Health Association, 370 Seventh Avenue, New York City
 - (15) Vital Statistics, A Discussion of What They Are and Their Uses in Public Health Administration, by John W. Trask, Assistant Surgeon General, United States Public Health Service; Supplement No. 12 to the Public Health Reports, April 3, 1914
- The Registration of Vital Statistics and Good Business, by Louis I. Dublin, Ph.D., Statistician of the Metropolitan Life Insurance Company; pamphlet published by Metropolitan Life Insurance Company, New York City
- Practical Uses of Vital Statistics, by Shirley W. Wynne, M. D., Chief of the Division of Statistical Research of the New York City Health Department; Reprint Series No. 66, February, 1918, New York City Health Department

NOTE.—As mentioned in a foot-note at the end of Part I of the foregoing article, there is now available for 50 cents, from the Government Printing Office at Washington, Public Health Bulletin No. 136, Report of the Committee on Municipal Health Department Practice of the American Public Health Association in cooperation with the United States Public Health Service. This document presents in summary form the results of an examination of municipal health department practice in 83 of the larger cities of the United States, summarizes its major defects and offers constructive recommendations for remedying them. Among the most interesting special articles in this report is An Ideal Health Department for a City of 100,000 Population, by C.-E. A. Winslow, Dr. P. H. and H. I. Harris, M. D., of the Department of Public Health, Yale School of Medicine. Every municipal official ought to read, at least, this section.

New Health Film Available

COINCIDENT with the campaign for the encouragement of periodic health examinations launched by the National Health Council, the Metropolitan Life Insurance Company has produced an excellent motion picture entitled "Working for Dear Life." This film interestingly tells the story of the average man who scoffs at the idea of periodical health examinations because, he says, he's "as sound as a dollar," and an ingenious parallel is drawn between the mechanism of that least understood machine—the human body—and that of the

best-known—the automobile.

"Working for Dear Life" is for free distribution, but it is hoped that all exhibitors who can do so will meet the necessary transportation charges. The film may be obtained from the Welfare Division, Metropolitan Life Insurance Company, 1 Madison Avenue, New York City. Literature and posters dealing with health examinations, appropriate for use in advertising the film, may be obtained from the National Health Council, 370 Seventh Avenue, New York City.

Chamber of Commerce Activities in Public Affairs

Water Company Deeds 110 Acres to City for Park Purposes

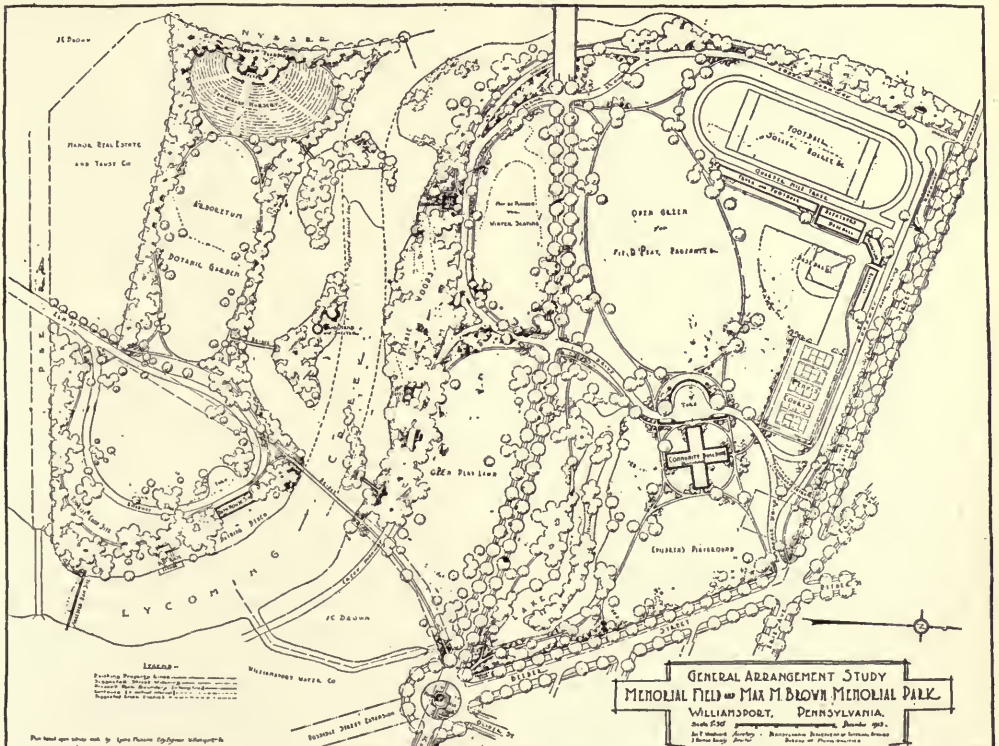
WILLIAMSPORT, PA.—This city can now boast of approximately 200 acres of municipally owned parks and playgrounds, as the result of the generous gift of 110 acres to the city by the Williamsport Water Company, a privately owned corporation. This company has transferred the land to the city of Williamsport by a "deed for uses, with reservations." It is to be used only for parks and recreation purposes, and the city must adopt a plan of development and begin to carry it out during the first two years of its control of the land; after which it is expected to expend not less than \$2,500 a year to carry out the plan and maintain and operate the grounds.

As this land is adjacent to Memorial Park, the opportunity presents itself for

the establishment of a continuous system of parks, with the possibility of a boulevard extending from the river along Lycoming Creek to the hills north of the city. According to plans already proposed, the new addition may be easily turned into a municipal golf course of eighteen holes, although this matter has not been definitely decided upon.

The offer of the Williamsport Water Company to deed this land over to the city has been pending almost two years, and was finally brought about by the combined efforts of the City Planning Commission and the Chamber of Commerce, and close cooperation between officials of the Water Company and the Williamsport City Council.

W. S. MILLENER,
Secretary-Manager, Williamsport Chamber of Commerce.



Reappraisal, City Planning Board and Ten-Year Prosperity Program

DAYTON, OHIO.—Since its reorganization in July, 1923, on a new basis of affiliation with all the existing luncheon clubs, civic and trade organizations in the city, the Dayton Chamber of Commerce has been successful in bringing about two important movements making for the future general development of the city along constructive lines. The first of these called for a reappraisal of property values, and the second for the creation of a City Planning Board.

During the past twelve or thirteen years the population of this city has greatly increased, and with this growth has come a corresponding increase in land values. Such increased valuations, however, have not heretofore appeared on the tax duplicate. The newly organized Chamber of Commerce, therefore, made the securing of a reappraisal of property its first important undertaking. After many months of effectual work in overcoming various obstacles, the order for a reappraisal was issued on January 21 of this year. The work will probably be completed by October 1, 1924, and it is estimated that the tax duplicate will be increased by at least 100 per cent, resulting in a corresponding reduction in the tax rate.

As its next activity, the Chamber undertook to secure the creation of a City Planning Board, this board to have complete jurisdiction over boulevards, streets, elimination of grade crossings, designation of municipal and county buildings, zoning, etc. To employ the city planning experts and assistants necessary to carry out this plan, it was estimated that an expenditure of \$25,000 would be required; and as no funds were available in the City Treasury for this purpose, the Chamber agreed to underwrite the movement. An ordinance creating a City Planning Board, becoming effective immediately, has since been passed by the City Commission, and the personnel of the Board will be selected by the Commission from recommendations submitted by the Chamber.

This step accomplished, the Chamber of Commerce has now inaugurated a Ten Years' Prosperity Program, in which it is proposed to centralize all of Dayton's present and estimated future needs for the next

fifty years in a combined bond issue to be voted upon by the electorate at a special election to be held early in the year 1925. Included in this suggested program of improvements are the following:

Elimination of grade crossings	New fire department buildings and equipment
Abandonment of canal and utilization for civic purposes	Paving and resurfacing of streets
Municipal water-softening plant	New public library
New school buildings	New Civic Building
New city hall	Patterson memorial
New county court house	Wright memorial
Storm and sanitary trunk sewers	Completion of Southern Boulevard
Sewage disposal plant, including interceptors and pumping-stations	New County Children's Home
Additional parks and playgrounds	River improvement (dam)
	Adequate pay for city employees
	Extension of city limits

A commission of forty or fifty citizens will shortly be appointed by the Chamber to secure accurate data on all these projects preliminary to a publicity campaign to be conducted during the three months prior to the special election. The cost of this publicity campaign, estimated at \$50,000, will be underwritten by the Chamber. The municipal, county and railroad expenditures covered by this program will approximate \$50,000,000, and coincident with this will be required an expenditure of private capital amounting to from \$150,000,000 to \$200,000,000. While authorization of such of these expenditures as must be met by municipal bonds will be voted upon at the one election next year, the appropriation of the funds will be distributed over a period of from ten to twelve years, according to the needs of the various projects and existing conditions.

WALTER B. MOORE,
Managing Director, Dayton Chamber of Commerce.

A Small City Cleans Up

SANGER, CALIF.—Realizing the importance of cleanliness in the community as a whole, the city of Sanger, under the management of the superintendent of the local grammar schools, held a thorough, well-directed clean-up campaign on January 12 last.

In order that the citizens might be well informed as to the part which they were expected to play, handbills and cards containing quotations from the city ordinances covering sanitary conditions and garbage and rubbish disposal were printed. These were distributed several days previous to the campaign by the boys of the grammar schools.

As a part of its cooperation in the work, the local Chamber of Commerce invited the Chief of the Fire Department of Fresno to address the regular weekly luncheon meeting of the Chamber, on the value of clean-up activities. The meeting was also addressed by the State Sanitary Inspector, who happened to be in Sanger at that time on a tour of inspection. Immediately following the luncheon, the two speakers, accompanied by a member of the official Clean-up Campaign Committee, made a trip through the business district, visiting all basements and storerooms, in order to look into the sanitary conditions, and also to recommend improvements that would help to bring about a reduction in the local fire insurance rates.

For the purpose of the clean-up drive, the city was divided into four sections. To each section were assigned three trucks, each truck manned by a captain and ten school boys in addition to the driver. At eight o'clock on the morning of January 12, over 240 volunteer workers assembled, clad in overalls, and began the actual task of cleaning the city. Their work did not cease until all vacant streets and lots were clean, and the rubbish removed to the city dumping grounds. At noon the workers gathered for luncheon at one of the vacant lots in the center of the city, where tables had been set up for the occasion. Seventy-five gallons of stew had been prepared in three large iron kettles and coffee made on kerosene stoves, and the meal was served by a group of twelve school girls under the supervision of the one woman member of the official committee.

SUMMERFIELD McCARTENEY,
Secretary, Sanger Chamber of Commerce.

Reducing the Ravages of the Rodents

FLINT, MICH.—At the suggestion of the local Board of Health and a representative of the United States Department of Agriculture, the Flint Junior Chamber of Commerce last summer inaugurated a campaign against the 100,000 rats estimated to be in existence in the business and residential sections of the city. In emphasizing the need for some action of this kind, the health officers pointed out that, according to Department of Agriculture statistics, a single rat consumes or destroys approximately \$2 worth of food and prop-

erty in a year. Figuring on this basis, the city of Flint was evidently suffering a total loss of \$200,000 annually through the ravages of the rodents. This fact, and a realization of the great extent to which disease is spread by rats, made the campaign one well worth the efforts of the Junior Chamber.

In carrying out the details of the campaign, and in rousing the cooperation of the general public, the Board of Health and members of the local Boy Scout troops rendered every possible assistance. Several thousand packages of poison were prepared by the Dairy and Food Department of the Board, together with members of the Junior Chamber, under the direction of the local rat exterminator. The packages were then distributed by Boy Scouts among 250 of the down-town stores, and the poison placed as bait in the basements of the buildings. The boys also distributed large quantities of poison to all the drug stores in the city, and the store-owners, in turn, cooperated by seeing that all individuals and institutions were supplied, upon request, with sufficient poison to exterminate the rats on their premises.

One feature of the campaign which accomplished some particularly good results was the Boy Scout contest, in which prizes were presented to the troops whose members collected the largest number of rat tails. The tails were all brought to the local fire stations, and through the courtesy of Fire Chief Price, the firemen were assigned the task of keeping a record of the tails collected by the various troops. The unusual nature of the contest aroused a lively interest among the boys, and a total of 10,847 tails were collected.

CLINT WOODBECK,
Editor, *The Flint Commercial*.

ANTI-RAT FILM

"The Modern Pied Piper," a two-reel motion picture portraying in detail a city-wide anti-rat campaign, has just been released by the United States Department of Agriculture. It will be distributed through the educational film service of the Department and the cooperating state institutions. Copies may be borrowed for short periods or may be purchased at the laboratory charge.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Right of Cities to Delegate Licensing Powers

AS an incident to the principle that a "public office is a public trust," appears the general rule that municipal legislative power cannot validly be delegated by the officials in whom it resides to others. Numerous are the cases in which courts of last resort have been called upon to consider whether licensing ordinances were or were not invalid as providing for unauthorized delegation of power. A reference to some of these cases will serve to at least roughly outline the law of the subject.

It is generally held that if discretionary power is vested in an administrative officer under a licensing ordinance, there must be some sort of definite rule of action to limit exercise of the power to reasonable bounds. The rule is well illustrated by the observations of the Massachusetts Supreme Judicial Court in a case where an ordinance forbidding occupation of a building in picking, sorting and storing rags, without a permit from the chief of the fire department, was held to be void (*Commonwealth vs. Maletsky*, 89 *Northeastern Reporter*, 245:

"Sections . . . of the ordinance before us, the validity of which sections is not brought in question, have provided for the materials and construction of buildings to be used for this business. Can the city of Chelsea also forbid any one from using for this purpose a building constructed in exact conformity with its requirements, unless he shall also have procured a written permit to do so from the chief of its fire department? The effect of this additional requirement is to leave it wholly to the will of that officer whether or not any person shall be permitted to engage in this business. No rules are provided for the exercise of his judgment. . . . Doubtless it is to be expected that a subordinate officer intrusted with such unlimited power will use it wisely and with a view only to the public good; but . . . there is nothing in the ordinance to guide him in passing upon the applications that may be made to him."

So, too, the Louisiana Supreme Court ruled that an ordinance forbidding operation of dairies within municipal limits without a permit from the council was held to

have been vitiated because:

"It is within the power of the city council to grant the privilege to some, to deny it to others. The discretion vested in the council is purely arbitrary. It may be exercised in the interest of a favored few. It may be controlled by partisan considerations and race prejudices, or by personal animosities." (*State vs. Mahner*, 9 *Southern Reporter*, 480.)

The same reasoning has been followed by other courts in annulling ordinances; for example, by the Maryland Court of Appeals in holding that unrestrained power could not be granted to the mayor to revoke permits for operation of steam engines (*Baltimore vs. Radecke*, 49 *Maryland Reports*, 217.) A Denver ordinance, giving the city health commissioner arbitrary right to determine whether license to operate a butcher shop should issue, was likewise decreed to be void. (*Walsh vs. Denver*, 53 *Pacific Reporter*, 458.)

A generally recognized rule of law that charter authority vested in a city council to fix license fees or taxes cannot be delegated to an administrative official was followed by the Washington Supreme Court in the case of *State vs. Scott*, 196 *Pacific Reporter*, 576. It was decided in that case that an ordinance purporting to forbid peddling without obtaining a license was void where it required payment of such license fee as the commissioner of public safety should deem suitable and proper, not less than \$1. Approving the reasoning of the Courts of New Jersey and Indiana in similar cases, the Washington Court observed that:

"The power to grant licenses and to fix the amount thereof having been reposed in the city council, that body had no right by ordinance to delegate this authority to the commissioner of public safety who, as such officer, in granting of the license and fixing the fee would act in an administrative capacity." In the Indiana case (*Bills vs. City of Goshen*, 20 *Northeastern Reporter*, 115), the Supreme Court of that state said that it was "material to the validity of an ordinance that a fixed and definite license

fee should be named in the ordinance, which all persons engaged in like business shall pay."

But the Georgia Supreme Court has decided that an ordinance empowering officials to grant or refuse licenses for the operation of hotels, lodging-houses, etc., was not invalid because it did not expressly prescribe a rule of action. (*Cutsinger vs. Atlanta*, 83 *Southeastern Reporter*, 263.) The Court held that there was an implied duty on the part of the officials to use reasonable discretion. And the Appellate Division of the New York Supreme Court sustained the validity of an ordinance of the city of Buffalo giving broad discretion to administrative officials in the matter of granting licenses for the sale of meat. The Court said:

"It will be observed that in some of the cases adverted to, the test upon which the discretion of the mayor was to be exercised was defined in the act or ordinance creating the authority, while in others there was no limitation placed upon it. It does not follow that the omission to prescribe the bounds of authority carries the conclusion that it is vested arbitrarily in the

official or body to whom it is committed. The difficulty of defining in a given case what standard shall be applied in the disposition of the petition, and the fact that the conservation of the public health is the basis for the existence of the authority, indicate the reason for the absence of definition; but it is no warrant for the inference that the power is an arbitrary one, to be exercised in ruthless disregard of the rights of any class or individual. The discretionary authority must rest somewhere, and experience has proven that its lodgment in some body or official of the municipality is more efficacious than to leave it with the legislature, to whom the local situation may be unknown." (*Buffalo vs. Hill*, 79 *New York Supplement*, 449.)

In the case of *Gundling vs. Chicago*, 177 *United States Reports* 183, the highest court of the land upheld an ordinance of the city of Chicago, conferring discretionary power on the mayor to determine whether an applicant for license to sell cigarettes was of good character and bore a good reputation. But the measure was treated as valid on a theory that the mayor was legally bound to grant a license to every applicant who fulfilled the qualifications of good character and reputation.

Sundry Items of Municipal Law

Restriction on Sunday Restaurant Operation Annulled

An ordinance of the town of Landis, N. C., was declared by the Supreme Court of the state to be invalid in so far as it purported to prohibit serving of meals by a restaurant owner on Sunday. (*State vs. Blackwelder*, 120 *Southeastern Reporter*, 196.) The Court held that the ordinance was unreasonable, oppressive and in derogation of common right.

Power to Condemn Dilapidated Buildings

Charter power vested in a city to declare to be nuisances wooden buildings within established fire limits when the same are dangerous to near-by buildings does not justify condemnation of a building on the mere ground of its being dilapidated, according to the decision of the Texas Supreme Court in the case of *Crossman vs. City of Galveston*, 247 *Southwestern Reporter*, 810.

Where Statute Authorized Board or Officer to Make Sale, City Held Powerless to Employ Auctioneer to Sell Property

According to a decision of the Ohio Supreme Court, a statute authorizing a board or officer to sell real estate belonging to the city impliedly requires the sale to be made directly by the board or officer, and does not justify employment by the city of an auctioneer for the purpose. (*State vs. Carrel*, 132 *Northeastern Reporter*, 161.)

Right to Enjoin Dance Hall Operation as Being a Nuisance Upheld

In the case of *Parker vs. Trueheart*, 246 *Southwestern Reporter*, 428, the Texas Court of Civil Appeals held that a temporary injunction was properly issued to restrain operation of a dance hall within ninety feet from plaintiff's house. It appeared that from 100 to 250 persons patronized the hall each evening, disturbing near-by residents in the enjoyment of their homes from 8 until 11:30 o'clock, and that intoxicated persons congregated in the neighborhood as an incident to the operation of the place.

Municipal Obligations Cannot Be Avoided by Reincorporation of the Municipality

The incorporation of a municipality by legal proceedings does not void its legally subsisting contracts, but on the reincorporation of the same inhabitants, and of a territory including street improvements for which bonds were given, the obligation to pay them devolves upon the new corporation. A statute making a vote of taxpaying voters necessary to the assumption of a new municipality of a debt of its predecessor, which has been abolished, is an unconstitutional attempt to impair the obligation of the contract, if a liability existed without such vote before the statute. (*North Carolina Supreme Court, Smith-Courtney Co. vs. Board of Road Commissioners of Hertford County*, 108 *South-eastern Reporter*, 443.)

THE AMERICAN CITY

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Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of

THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Recent Zoning Ordinances

CAMBRIDGE, MASS.—Ordinance, January 7, 1924.

LONGMEADOW, MASS.—Ordinance, October 3, 20, 1922.

Recent Zoning Decisions

CALIFORNIA.—*Miller v. Board of Public Works of City of Los Angeles*, District Court of Appeal. This case was commented on in the February "Zoning Notes." At that time the opinion, since received, was not at hand.

The plaintiff is the owner of a lot zoned as residential. Under the first of two ordinances here referred to, residences designed for any number of families were allowed on the lot in question, and the plaintiff applied for and obtained a permit for the construction of a four-family house. This permit was cancelled on the ground that the City Council had ordered its revocation for the reason that it was about to pass an ordinance which would prohibit the erection of flats in that district. Thereupon, on September 1, 1921, this action was brought to compel the issuance of the permit. On September 6, 1921, an emergency ordinance was enacted allowing only residences for not more than two families to be constructed in the district. The questions of the defendant's power to revoke a permit once issued, and to pass an ordinance of this nature to operate retroactively, are not, however, raised; the sole question argued being the constitutionality of a regulation creating residential districts, from which four-family houses are excluded. As stated in the February issue, the case holds that the regulation in question is not a proper exercise of the police power, since four-family houses are not necessarily a menace to the public health, safety or general welfare. The bulk of the opinion is a clear exposition of this proposition. There are also dicta seeming to imply that stores and similar activities cannot be excluded from residential districts, but only nuisances; the Court citing and either distinguishing or declining to follow the numerous decisions to the contrary. The case has been appealed.

NEW YORK.—*Lourose Realty Corporation v. Putnam*, Special Term, Supreme Court, reported in *New York Law Journal*, December 7, 1923, page 847. Defendant asked for a permit for the construction of a number of separate buildings each arranged for garages for five or less cars. Plaintiff seeks to restrain their completion. Motion denied. If defendant intends to rent the separate buildings

to individuals for use in good faith as tenants, although defendant intends to control and manage the runways and have a man clean cars for the tenants, and operate a central heating plant, that would be no violation of the zoning regulation. But if defendant directly or indirectly proposes to operate and control the buildings for his own use and let out space for automobiles as is ordinarily done in a public garage, then he would be violating the spirit if not the letter of the regulation. He would in that case be circumventing the purpose of the statute; for the separate buildings would be virtually one building with partitions between. The real situation will be disclosed at the trial. Even if it did clearly appear that the defendant intended to use the premises in violation of the zoning regulation, the erection of the buildings would not be restrained, because a lawful use of them might be made; nor does the plaintiff show the damage to himself necessary for him to sustain this action, in a matter in which, primarily, the duty of enforcing the law rests with the public authorities.

Municipal Gas Co. v. Nolan, Superintendent of Bureau of Buildings, City of Albany, 201 New York Supplement 582 (August 21, 1923). Where a building superintendent refused to examine plans for the construction of a gas-tank, and refused to issue a permit therefor on the ground that a city ordinance prohibited the construction of gas-tanks within the city limits, there was a refusal to act, and no determination for review to vary and modify the strict requirements of the building ordinances in cases of unnecessary hardship, or by certiorari; and mandamus was the proper remedy.

Under Laws 1921, Sec. 221, establishing a board of appeals to review the determinations of the superintendent of buildings, and vary and modify the strict requirements of the building ordinance in cases of unnecessary hardship, the board has no power to pass upon the constitutionality of a city ordinance.

An ordinance prohibiting the construction of gas-tanks within the city limits was unreasonable and arbitrary and therefore unconstitutional.

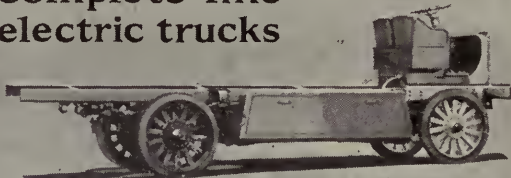
Where in a mandamus proceeding, the Court determined that such an ordinance was unconstitutional, a motion restraining the city officials, who had previously enforced the ordinance, from interfering with the construction of the tank, will be denied, where it is not likely that the officials will ignore the mandamus order.

The 1924 Autocar Line

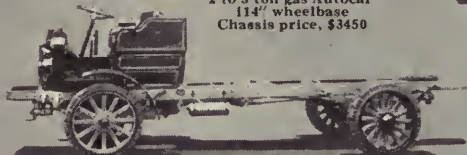
The only complete line
of gas and electric trucks



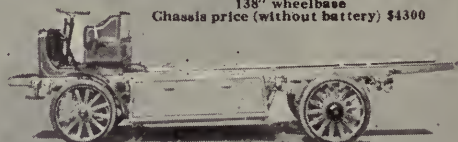
2 to 3 ton gas Autocar
114" wheelbase
Chassis price, \$3450



5 ton Autocar Electric
138" wheelbase
Chassis price (without battery) \$4300



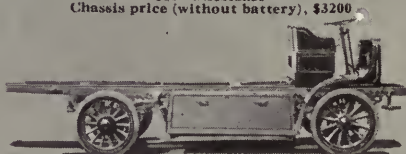
2 to 3 ton gas Autocar
138" wheelbase
Chassis price, \$3550



3 ton Autocar Electric
128" wheelbase
Chassis price (without battery), \$3200



4 to 6 ton gas Autocar
120" wheelbase
Chassis price, \$4650



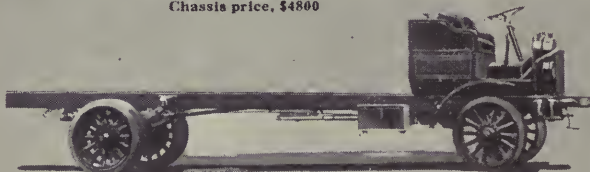
2 ton Autocar Electric
120" wheelbase
Chassis price (without battery), \$2800



4 to 6 ton gas Autocar
156" wheelbase
Chassis price, \$4800



1 ton Autocar Electric
107" wheelbase
Chassis price (without battery), \$2400



4 to 6 ton gas Autocar
192" wheelbase
Chassis price, \$5200



1 1/2-2 ton gas Autocar
97" wheelbase
Chassis price, \$2200

The Autocar Company, Ardmore, Pa.

ESTABLISHED 1897

Branches in 46 Cities

Autocar

gas and electric trucks

EITHER OR BOTH - AS YOUR WORK REQUIRES

It should be noted that this case, although not interpreting a zoning ordinance, has a bearing upon zoning in many of its phases.

OHIO.—*Ambler Realty Co. v. Euclid Village*, U. S. District Court, Northern District of Ohio, Eastern Division, January 14, 1924. The decision in this case, mentioned in February "Zoning Notes," is now at hand. The facts seem to be substantially as stated in our February issue. They seem to show that the regulations, as applied to the areas in question, were unreasonable. The Court reviews the zoning and other more or less relevant cases at length, and takes occasion to state that, in its opinion, zoning, in most of its phases, is

unconstitutional.

An interesting variation in the forms of zoning regulations is to be found in the Cambridge ordinance, noted in this issue of the "Zoning Notes." It consists in the enactment of the zoning provision and the building code, usually separated, as one ordinance. While there are advantages in this form of enactment, it should be remembered that there are substantial differences in the two classes of provisions which must be kept in mind, in order that procedure applicable in one case may not be applied in the other.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

THE threat of income tax reduction has not damaged the municipal bond market. The Mellon tax bill would decrease the tax-exemption value of state and city bonds by lowering rates, especially those in the high-income brackets. So would the substitute proposals which have been offered, although to a less extent. The bond market, however, reflects the belief of investment bankers and tax-exempt bond buyers that Mr. Mellon's program is not going to be enacted into law at this session of Congress.

During the month of January and the first two weeks of February about \$145,000,000 new issues of state and municipal bonds were underwritten by the investment houses specializing in tax-free securities. During the same period, it is estimated that investors absorbed between \$75,000,000 and \$100,000,000 worth of tax-free bonds. While it is true that the shelves of the dealers in state and city bonds are at this time well stocked, it is also a fact that comparatively little new financing is in view during coming weeks. Bonds of this class are being absorbed by institutions and private investors at prices yielding from 4 per cent for the highest-grade legal savings bank bonds, to 5 per cent or more for the western and

southern county district and small-town issues.

Compared with the latter part of 1923, municipal bond prices have advanced slightly. But a study of bond-market averages, tracing the course of prices of railroad, public utility, industrial and municipal issues since January 1, 1923, discloses the fact that the price spread between tax-exempt municipals and taxable railroad and other private corporation securities has been considerably reduced.

The recent new public financing brought to the attention of investors embraces many important offerings of state, city and county bonds.

IMPORTANT MUNICIPAL BONDS SOLD DURING FEBRUARY

Amount	Borrower	Maturity	Coupon Rate (%)	Net Yield (%)
\$12,000,000	Philadelphia, 1974 opt.			
	Pa.	1944	4½	4.18
10,000,000	Minnesota	1944	4¼ & 4¾	4.52
3,000,000	Porto Rico ...	1944-49 opt. 1943	5	4.63
1,000,000	Toledo, Ohio, Sch. Dist. ...	1924-48	5	4.64
2,000,000	St. Louis, Mo. ...	1929-44	5	4.76
11,000,000	Los Angeles, Calif.	1925-64	4½ & 5	4.88
1,260,000	El Paso Co., Texas ...	1954 opt. 1939	5	5.00
3,000,000	South Dakota ...	1934-44	5 & 5½	5.02

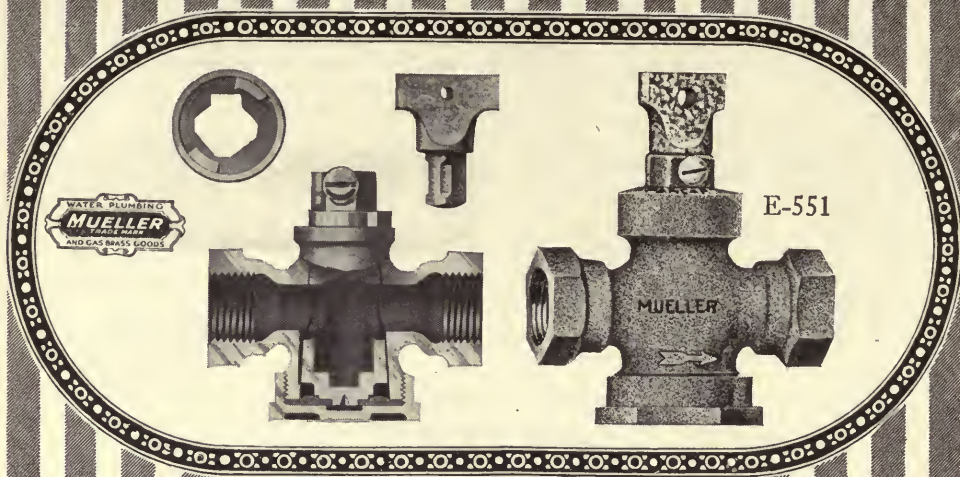
Newspapers Conduct National Oratorical Contest

TO increase interest in and respect for the Constitution of the United States, about 200 newspapers throughout the country are cooperating in conducting a nation-wide oratorical contest among secondary-school students. The contest calls for original orations, requiring not more than twelve minutes each for delivery, on one of the following subjects:

The Constitution, Washington and the Constitution, Hamilton and the Constitution, Jefferson and the Constitution, Madison and the Constitution, Marshall and the Constitution, Webster and the Constitution, Lincoln and the

Constitution.

For the purpose of this project, the country has been divided into seven zones. The selection of winners will proceed by classes, schools, groups of schools and major newspapers' territories until the winner in each zone has been determined. These seven winners will then compete in Washington on June 6, 1924, for the three national prizes for \$3,500, \$1,000 and \$500. Further details as to the contest may be had upon request from Randolph Leigh, Director, National Oratorical Contest, Room 1012, Pulitzer Building, New York City.



The "Time-Test" of Underground Work

Durability and freedom from expensive repairs is the "time-test" of underground work. For this reason, many water-works companies specify Mueller equipment throughout.

Note carefully the construction of the Mueller Curb Stop No. E-551 shown above. The key is tapered toward the top, and cannot set or stick under the weight of the rod.

MUELLER *Inverted Key Curb Stops*

are so built that the water is forced beneath the key through the by-pass on the inlet side—thus forcing the key up and holding it tight to its bearings.

The patent cap prevents dirt from working down and causing a leak, or interfering with the perfect opening or closing of the stop. Each stop is thoroughly tested under 200 pounds hydraulic pressure, and is fully warranted.

Write for detailed descriptions and prices in any quantity.

Mueller Co., Decatur, Illinois, U. S. A.

145-149 W. 30th St., New York; 1072-76 Howard St., San Francisco; 2468 Hunter St., Los Angeles

From the International Union of Cities

Announcement

READERS of *THE AMERICAN CITY* will recall that several months ago some account was given in these pages of the formation in Brussels, in 1920, of what is known as the International Union of Cities, an organization to collect and study contemporaneous documentary information of all kinds relating to civic affairs, to supplement this research work by the preparation of briefs or short reviews, and to distribute these, carefully and systematically classified, as promptly as may be throughout the civilized world. With headquarters in Brussels and "Centers" formed or forming in all important countries, this project is now well under way, particularly as far as Europe is concerned, and is proving itself an instrument of great value to progressive city officials and students of civic affairs.

A committee of the American Society of Landscape Architects,* whose efforts have been endorsed and aided by several other national organizations interested in civic advance, has been at work upon the project of establishing in Washington, D. C., an American Center of Civic Documentation, to be affiliated with the European organization, thus not only giving our progressive cities the benefit of the invaluable data they are collecting and distributing, but furnishing them with worth-while material of this sort from America. Various means of accomplishing this purpose have been proposed and rejected; but what is expected before many months to prove a practicable method of solving the problem is now being worked out. In the meantime *THE AMERICAN CITY* is glad to be able to cooperate with this committee in publishing a few columns of the sort of data now being regularly disseminated throughout Europe—a sample or foretaste, so to speak, of what may be expected when the proposed Washington "Center" is fully developed.

It will be noted that while these briefs or items are first classified under such general headings as City Planning, Housing, Water-Supply, Sewage and Sewage Disposal, Refuse-Removal, Light, Heat, Power, Transportation, Public Health Administration, Education, and so on, each brief is also numbered (at the top) in accordance with the well-known Dewey decimal classification system. By this means, without having to reread each item, any official or specialist can automatically, by a simple grouping of numbers in their decimal succession, assemble collections of subjects of one class very easily and very completely—much

better than would be possible by a classification under brief title or heading, particularly as the notes are taken from the literature of all languages. In order to facilitate this clipping and filing, the items are printed on one side only of the page and therefore it will be an easy matter to keep one's data constantly up to date in whatever branches of the broad field there may be particular interest.

But the Brussels office does not limit itself to this careful study, briefing and publication of current civic documentation data; it has on hand a very complete file of all the material from which these briefs have been prepared, and is therefore ready, at slight expense and short notice, to supply those desiring it with more detailed information—complete reports or special articles, for example, or with photographs or photostat reproductions, copies of plans and other details. It is suggested that, in requesting additional data, readers identify the particular subject by use of the item number which appears at the end of each paragraph.

71 (43.21)

CITY PLANNING. Saxony, Germany.

A City Planning Seminary.—A City Planning Commission for the Free State of Saxony has been founded at Dresden, and has become an organized part of the free Academy of City Planning of Berlin. This has for its object the bringing together of all who are occupied with either the scientific or the more practical phases of city planning, in order to permit them to become familiar with the progress of all projects in the domain of city planning, to encourage good tendencies, to combat errors, and to make known to all the progress of the science and art of city planning. I. No. 278

71.31 (42.72 B.)

TOWN PLANNING. Lancashire, England.

Extension of the Seashore of Blackpool.—Thomas Mawson of London has prepared an excellent plan with perspective showing the improvement of the southern portion of the well-known health resort. The plan, which includes an area of 100 acres, has been treated as a rich residential quarter, with business and commercial centers, churches, hospitals, playgrounds and gardens. The famous promenade will be extended, sheltered by the breakwater which is now being constructed. The proposed marine gardens will be established behind these in order that they may be sheltered from the high winds. I. No. 281

71.313 (42)

GARDEN CITIES. Holland.

A Garden Village at Het Gooi.—The city of Amsterdam has named an investigation committee with the object of creating a garden city or garden villages, to be situated some distance from the capital, either in Het Gooi or elsewhere. The commune of

*The special committee referred to is known as Standing Committee of the American Society of Landscape Architects to Cooperate with the International Union of Cities and its Centers of Civic Documentation. Its members are: Stephen Child, Chairman; Professor James Sturgis Pray, Chairman School of Landscape Architecture and City Planning, Harvard University, and Frederick Law Olmsted, Past President, A. S. L. A.



Get Ahead— Put Your Roads in Shape Now

RIGHT now is the time to get busy on road repairs. Don't wait for summer weather. Avoid the delays of former years. Get after these holes, humps and hollows early—right *now*.

"Tarvia-KP" is the universal patching material — good for every type of road. "Tarvia-KP" is liquid, easy to handle and apply, not injured by freezing weather and no special equipment is necessary. Patches made with "Tarvia-KP" are dense, durable, and form a perfect bond with the road.

Our nearest office will upon request send you an illustrated booklet showing each step in patching with "Tarvia-KP."

Tarvia
For Road Construction
Repair and Maintenance

The *Barrett* Company

New York	Chicago	Philadelphia	Boston
St. Louis	Cleveland	Cincinnati	Pittsburgh
Detroit	Kansas City	Birmingham	Dallas
Minneapolis	Salt Lake City	Bethlehem	Lebanon
Youngstown	Milwaukee	Toledo	Columbus
Baltimore	Syracuse	New Orleans	Rochester

THE BARRETT COMPANY, Limited: Montreal Toronto
Winnipeg Vancouver St. John, N. B. Halifax, N. S.

Het Gooi has not been invited to set forth its wishes before this commission, and it has protested against the creation in the country of a working man's town, which will depend directly upon Amsterdam.

I. No. 282

71.5 (42.67 S.)

Essex, England.

HIGHWAYS.

Projects for the Replanning of Southend-on-Sea.—An illustrated report has been prepared giving details of four city planning projects, which together cover a total area of 2,430 hectares. The projects include, beside the establishment of the new main artery from London to Southend, two other roadways 30 meters in width at each side of this main roadway. The purpose of these is to divert to the east of the town a part of the London traffic. The breadth of the highways projected will vary from 11 to 35 meters between sidewalks. The broad streets will be established in the form of boulevards and will be a great improvement to such a locality as Southend. The minimum distance between building lines is 20 meters; 220 hectares are reserved for parks.

I. No. 285

71.5 (43.515)

HIGHWAYS: APPEARANCE OF THE STREET.

Hamburg, Germany.

Proposed Building Law for Hamburg.—A law will soon be enacted at Hamburg, taking away from the office of Building Construction (Baupolizei) the control of construction of buildings, in order to grant this to a council to be formed of members of the Hamburg Senate and of citizens completed by a Council of experts. This Council will have power to oppose its objections to disfigurements of the streets by inappropriate building constructions, and also by unfortunate advertisements.

I. No. 286

71.5: 62.5 (944)

BRIDGES.

Australia.

A Bridge with a Span of 1,650 Feet.—At Sydney, they are about to commence the foundations of a bridge with a span of 1,650 feet, which will be the longest bridge of this sort. The bridge will join together the city of Sydney and its suburb, Milson Point. The cost of the project, the execution of which will probably take six years, is estimated at 7 million pounds sterling. The authorities of Sydney demand from the contractor a guarantee of 250,000 pounds sterling, a sum which will be paid back when the work has been completely accomplished.

I. No. 287

PLAYGROUNDS.

Germany.

The Laying Out of Athletic Fields and Playgrounds.—A German expert maintains that in order to respond to the modern needs of athletic fields and playgrounds, it is not necessary to limit one's self to the laying out of these places, but rather to realize at the same time verdant conditions: (1) the ancient parks and verdant open spaces, with

a character purely decorative, may be transformed for the use of young people and to the profit of public health; (2) playgrounds and athletic fields, the technical purpose of which does not demand a framework of verdure, should be enhanced by gardens in order to permit a happy disposition, recalling the most beautiful parks of cities.

I. No. 292

33.332 (492)

Holland.

HOUSING.

Extension of the Amortization of Loans.—A Dutch expert recalls numerous propositions of administrators of building associations, their effect to extend from 50 to 75 years the period of amortization in order to reduce the charges of exploitation, and consequently the relatively high rents. The author proves by examples that the reduction of rents thus obtained is insignificant. Furthermore, the recent buildings grow old relatively quickly; it is important then to amortize them in 50 years rather than 75.

II. No. 393

33.41 (494.34)

BUILDING COOPERATIVE SOCIETIES.

Zurich, Switzerland.

The Activity of a Building Cooperative Society at Zurich.—The construction of ten houses with multiple apartments, including 22 lodgings of 4 rooms each, and 34 lodgings of 3 rooms each, ready to be occupied. Two other projects are under construction. The Cooperative Society has completed altogether in the past few years 240 lodgings in various parts of the city.

II. No. 396

72.811 (43.36)

HOUSING. Upper Bavaria, Germany.

Types of Houses of the Building Society "Brannenburg" in Upper Bavaria.—Interesting types of houses termed "Brannenburg" have been erected by a Construction Society at Brannenburg, Upper Bavaria. The plans are characterized by an economic and appropriate distribution, by a possibility of large application of the principle of standardized parts, by an economy of time in construction, by a perfect utilization of material, etc. Standardization is carried to the limit, but this does not interfere with the satisfactory appearance of the types of houses; they comply with local forms of construction.

II. No. 407

72.811 (43.47)

HOUSING. Wurtemberg, Germany

Typical Plans of Workmen's Houses.—The Committee of the Council of the Building Industry of the Office of Wurtemberg, at Stuttgart, has published in the edition "Eugen Wahl, Stuttgart," an important collection of 27 typical plans of workmen's houses. The practical utility of this consists in the fact that one may rapidly (being given a building site) judge of the economy of each one of the typical plans applicable to the conditions of the topography and orientation.

No. 408

THE AMERICAN CITY

The Bear Tractor



Speed—Quick Turning—Easy Control —These You Need for Road Patrol —And These You Have in the Bear

AS ONE man said, "It seems the Bear is *specially made* for nearly every job." The truth is, practically every feature in the Bear is of advantage in every kind of tractor work. So, while the Bear is termed a *universal* tractor, most Bear owners feel that it was designed *especially* for them.

And nowhere is this feeling more pronounced than among the men who are doing road patrol work. If all your other tractor work were eliminated from consideration, it is doubtful if a better tractor could be built at the present time for road patrol.

Not only is the Bear *fast*, not only is it *quick at the turn*, not only is it *easy to control*—but it supplies *cheap* power, whether pulling a half load or a full load. Its power flexibility, its efficiency in delivering its power to the drawbar, its economy in fuel and oil consumption, its low upkeep as illustrated in the track—these are some of the reasons *why* the Bear supplies cheap power for road maintenance.

It will cost you nothing to learn a lot more about the Bear Tractor. A book, just published, will be sent to you on request.

BEAR TRACTORS INC.

5330 PARK PLACE

NEW YORK, N. Y.

The Tractor that Delivers its Power to the Drawbar

Municipal and Civic Publications

Prices do not include postage unless so stated

The Principles of Vital Statistics.—By I. S. Falk, Ph.D., Department of Public Health, Yale University. W. B. Saunders Company, Philadelphia. 1923. 258 pp. Charts, tables. \$2.50.

A simple, clear and readable introduction to the subject of vital statistics. It describes the more important procedures and sources of information used in statistical inquiries, and gives outstanding evidences and conclusions of interest to workers in public health, cautioning the untrained statistician on certain essential points in the keeping of vital statistics.

Introduction to Medical Biometry and Statistics.—By Raymond Pearl, Professor of Biometry and Vital Statistics in the School of Hygiene and Public Health, and of Biology in the Medical School, the Johns Hopkins University. W. B. Saunders Company, Philadelphia. 1923. 379 pp. Illustrated. \$5.00.

Written for the medical reader primarily, and showing how he may find the point of view of biometry (the dealing with statistics derived from living things), and the application of modern statistical methods useful in drawing conclusions from his facts and in solving problems constantly arising in his work, which cannot be solved correctly without such methods.

Highway Engineering.—Proceedings of the Ninth Annual Conference on Highway Engineering, held at the University of Michigan, February 12-15, 1923. University Bulletin, October 27, 1923. The conference was held under the direction of the College of Engineering of the University, with the cooperation of the Michigan State Highway Department and the Michigan Association of Road Commissioners and Engineers. 244 pp. Views, charts, drawings, tables. Valuable information on the design, construction and maintenance of roads and highways and on highway bridge problems. (Apply to the College of Engineering, University of Michigan, Ann Arbor, Mich.)

Water Metering and Fire Prevention.—Address by Col. A. A. Spragne, Commissioner of Public Works, Chicago, at a City Club Forum meeting, October 11, 1923. 8 quarto pp. Stating that Chicago's daily water waste is equal to two-thirds of the entire amount pumped for Greater New York, and that, "properly meterized, the Chicago system will effect a minimum saving of \$285,000,000 in the next twenty-five years." (Apply to the City Club of Chicago, 315 Plymouth Court, Chicago, Ill.)

Motor Bus Raises Educational Standards.—By J. F. Abel. Reprint from "School Life," November, 1923. 4 pp. Illustrated. Showing that school consolidation in rural districts gives country children school advantages equal to those of the city, and that good roads are essential in bringing this about. (Apply to the National Motor Truck Committee, National Automobile Chamber of Commerce, 366 Madison Avenue, New York, N. Y.)

The Proposed One Hundred Million Dollar Road Bond Issue for Illinois.—By Frank T. Sheets, State Superintendent of Highways. January 1, 1924. 21 pp. Charts, table. Analyzing the proposed bond issue from the economic and business standpoint. This matter will come up for ratification in November, 1924. (Apply to Clifford Older, Chief Highway Engineer, Division of Highways, Department of Public Works and Buildings, Springfield, Ill.)

Mortality Rates, 1910-1920.—Bureau of the Census report, published 1923. 681 quarto pp. Text, tables, charts. With population of the Federal Censuses of 1910 and 1920 and intercensal estimates of population. Prepared under the direction of Dr. William H. Davis, chief statistician for vital statistics, and under the immediate supervision of Richard C. Lappin, expert special agent of the Bureau of the Census. (Apply to the Government Printing Office, Washington, D. C.)

State Supervision of Municipal Indebtedness.—By Lane Lancaster, The University of Pennsylvania, Philadelphia, Pa. 1923. 108 pp.

A thesis in political science presented to the Faculty of the Graduate School of the University of Pennsylvania in partial fulfillment of the requirements for the degree of Doctor of Philosophy. The purpose of the study is to discover the extent to which our state governments have adopted real policies toward local indebtedness, and the degree to which such policies conform to the true nature of the problem of the relation of principal and agent, which, in the opinion of the author, requires that the principal should (1) impose certain approved standards, and (2) create adequate machinery for enforcing compliance with such standards.

The Administration and Politics of Tokyo.—By Charles A. Beard, formerly Director of the New York Bureau of Municipal Research. The Macmillan Company, New York. 1923. VII + 187 pp. \$2.50 postpaid.

This study of Japanese municipal government was carried on in Tokyo by Dr. Beard in the winter and spring immediately preceding the earthquake. It was undertaken at the request of Viscount Goto, who was then Mayor of Tokyo, and who summoned Dr. Beard again, as the representative of the Bureau of Municipal Research, six days after the earthquake. It has been made evident that the usefulness of the survey has not been nullified by the disaster, and that there is now room for a new and adequate administration of city affairs such as this volume outlines.

Survey of City and Regional Planning in the United States, 1923.—By Theodora Kimball, Librarian, School of Landscape Architecture, Harvard University, Cambridge, Mass. With a list of plan reports 1922-1923. Reprinted from "Landscape Architecture," January, 1924. 16 pp. Covering recent news from nearly 250 cities in 42 states and the Territory of Hawaii on notable achievements, legislation, and general progress in city and regional planning and zoning, including improvements in street systems, the promotion of parks and civic centers, and the study of rapid transit, railroad terminals and port development. This survey should make a strong appeal to town and city officials and state legislatures to realize and use their present opportunities of controlling future development. (Apply to author.)

Character Education Methods.—The Iowa Plan (\$20,000 Award, 1922). Published by the Character Education Institute, Chevy Chase, Washington, D. C. A business man known in this connection only as "The Donor," offered to state groups of research educators, through the Executive Committee of the Character Education Institution, a \$20,000 prize for the best public-school method for character education of children and youth. Only 26 states worked out plans for submission. Iowa's group won the award, with the plan presented in this pamphlet, 5,000 copies of which are being published at the expense of The Donor for free distribution in order to secure criticism and advice. (Apply to the Character Education Institution.)

Chicago Firemen—Their Efficiency and Compensation.—Submitted by the Firemen's Association of Chicago, Local No. 2, as a report regarding their request for an increase in salaries. November 30, 1923. 27 pp. Charts and tables. Prepared by The Labor Bureau, Inc., 440 S. Dearborn Street, Chicago, Ill. (O. Zimmering). (Apply to the Bureau.)

How to Guard Against Crime.—Issued by Richard E. Enright, Police Commissioner, New York City. 16 pp. Pocket size. A list of "Don'ts" for householders and others, at home or in public places, and for banks, in order to protect property and life and to apprehend dishonest persons. (Apply to the Commissioner.)



for the Spring Rush

“We telephoned you a rush order for a tractor to be used on a particularly ‘tough’ strip of grading, ripping up an old macadam road,”

writes an owner of a Best “Sixty.”

“NOW—we would not be without it for twice the price.”

If you have rush work ahead of you this spring, *investigate the reputations which Best “Thirties” and “Sixties” have made for getting tough jobs done on time!* A list of nearby owners will be sent on request.

Factory Branch—
Warehouse
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New York City
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C. L. BEST TRACTOR CO.

General Offices—Factory
SAN LEANDRO, CALIFORNIA

27-324

BEST TRACTORS

The Municipal Budget.—Publication No. 1 of the League of Minnesota Municipalities. 24 pp. November, 1923. Presenting briefly the contents of a municipal budget and the method of procedure in preparation, with forms for budget statements. Written primarily as offering suggestions for those officials that are contemplating a budget system and do not know how to proceed. (Apply to Morris B. Lambie, Executive Secretary, League of Minnesota Municipalities, University of Minnesota Library, Minneapolis, Minn.)

Housing Problems in Relation to Industry.—By Bernard J. Newman, Managing Director, Philadelphia Housing Association. 4 quarto pp. in "Engineers and Engineering," published by the Engineers' Club of Philadelphia, 13-15 Spruce Street, Philadelphia, Pa. Illustrated. Showing the effect of home life and environment on the will to produce and the capacity to work, and presenting a survey of the housing conditions of Philadelphia workers and the great need of betterment. (Apply to the publishers.)

Better Homes in America.—How to Organize the 1924 Campaign. Guidebook for Demonstration Week, May 11-18, 1924. Publication No. 1 issued by Better Homes in America, an educational organization incorporated in the state of Delaware, 1923; national headquarters, 1653 Pennsylvania Avenue, Washington, D. C. 16 pp. Showing how to organize a Better Homes demonstration in your home town, and describing the prize-winning demonstrations of 1923. (Apply to the national headquarters.)

Guide for the Organization of Local Music Weeks.—In cooperation with National Music Week. Issued by National Music Week Committee, 105 West 40th Street, New York, N. Y. 30 pp. Music Week started as a city-wide rather than as a nation-wide observance and has already spread to 150 different cities and towns by its own momentum. The information in this booklet is of a general nature, designed to serve the average community. (Apply to the publishers.)

Housing and Regional Planning, New York State.—Report of Commission of Housing and Regional Planning to Governor Alfred E. Smith and to the Legislature of the State of New York on the present status of the housing emergency. December 22, 1923. Legislative Document (1924) No. 43. 102 pp. Embodying an examination into conditions in the cities to which the rent laws apply: New York, Albany, Schenectady, Amsterdam, Troy, Cohoes, Watervliet, Rensselaer, Buffalo, and Rochester, and showing that the housing emergency still exists in all of the cities examined except Rochester. George Gove is Director of Investigations. (Apply to Clarence S. Stein, Chairman of the Commission of Housing and Regional Planning, 949 Broadway, New York, N. Y.)

Zoning Law for Boston.—Preliminary Draft of Zoning Law for the City of Boston, Proposed by the City Planning Board. January, 1924. 23 quarto pp. Prepared for the Board by Arthur C. Comey, Zoning Director. Accompanied by "Outline of Proposed Zoning Plan for City of Boston" (9 mimeographed sheets) and "Summary of the Proposed Zoning Statute" (2 mimeographed sheets). (Apply to Frederic H. Fay, Chairman, The City Planning Board, 30 City Hall, Boston, Mass.)

The Charter of Denver, Colo.—"The Little Charter." A ready reference digest of the charter of the city and county of Denver. 1924. 23 pp. Printed under the administration of Mayor Benjamin F. Stapleton; compiled by E. C. MacMechen, Publicity Director. Prepared for the convenience of teachers and students of civics and members of local improvement associations, and covering all parts upon which the average citizen requires information, though not for attorneys or as a reliance in legal action; approved as to fact by the legal department of the city; containing also certain miscellaneous information for which there is a demand. (Apply to the Publicity Director.)

Pollution of Wells.—"The Principles Underlying the Movement of Bacillus Coli in Ground-Water, with Resulting Pollution of Wells." By C. W. Stiles, Professor of Zoology, Hygienic Laboratory, and Harry R. Crohurst, Sanitary Engineer, United States Public Health Service. Reprint, 1923, No. 844 from the Public Health Reports, June 15, 1922. 6 pp. (Apply to the Government Printing Office, Washington D. C.)

Police Statistics.—Tabulations made by the Bureau of Statistics and Municipal Reference Library, Chicago. 3 mimeographed sheets: Total Expenditures of Police Departments in 53 Cities of the United States, 1918-1921; Total Number of Arrests in 57 Cities 1918-1921; Strength of Police Forces in 43 Cities 1918-1921 and for the Period Ending June 30, 1922. (Send 5 cents postage to Frederick Rex, Municipal Reference Librarian, 1005 City Hall, Chicago, Ill.)

City Planning, Elizabeth, N. J.—Preliminary Report on the Elizabeth City Plan, by the City Plan Commission. 1923. 46 pp. Views, maps. Discussing the major problems which the city now faces, outlining the fundamental data necessary for dealing with them, and thus presenting the basis of a program to be elaborated. (Apply to the consulting engineers, the Technical Advisory Corporation, 15 Park Row, New York, N. Y.)

The City Manager Plan of City Government.—An explanation of what the city manager plan is, where it is used, and how it works. Published by The City Managers' Association. January 23, 1924. To be revised July 1, 1924. 32 pp. Containing the following: "Three Plans of Government"; "Where the City Manager Plan Is Used"; "How the City Manager Plan Works" (newspaper comments, letters from citizens); books and pamphlets on the city manager plan. 10 cents. (Apply to John G. Stutz, Executive Secretary, Lawrence, Kans.)

Why Tax Public Securities?—By John A. Lapp, LL.D. In "Public Ownership" for January, 1924, published by the Public Ownership League of America, 127 North Dearborn Street, Room 1439, Chicago, Ill. 10 pp. "The real meaning of the movement for a constitutional amendment to prevent tax-exempt securities." An address first delivered at the Public Ownership Conference at Toronto September 11, afterwards revised and given before the Chicago Public Ownership Lunch Club, December 27, 1923. (Apply to publishers.)

The City Manager Plan in Westerville, Ohio.—"Eight Years of Progress under the Manager Plan in Westerville." 7 pp. Published by Richard Biehl, City Manager, Westerville. January 23, 1924. Answering requests for information and giving details of the assets of the village. (Apply to the City Manager.)

Child Life and Play Space.—"An Opportunity for the Real Estate Men of the Country to Help Solve an Increasingly Serious Problem with Respect to Child Life and Play Space." By William E. Harmon. Pamphlet No. 198, published by the Playground and Recreation Association of America, 315 Fourth Avenue, New York, N. Y. 12 pp. Discussing the proposition of segregating for recreational purposes, say, 10 per cent of the land in any given subdivision. Arguments under three heads: cost in dollars or land to the owners; value to property so developed; the need and the value to the public. (Apply to the publishers.)

Parliamentary Debates.—Official Reports of the House of Commons and the House of Lords. Subscription rates for a complete session, usually one year, £3.10.0 and £2.15.0, respectively, postpaid. Individual copies, 7d postpaid. (Apply to Director of Publications, H. M. Stationery Office, Imperial House, Kingsway, London, W. C. 2, England.)

Recreation and Community Service, Houston, Tex.—Annual Report of the Department and Association for 1923, including the Leisure Hours Pageant, which was produced at the annual meeting to show the service rendered during the year. 20 pp. Illustrated. The Association supplements the work of the Department and receives its budget from the Community Chest. (Apply to Corinne Fonde, Executive Secretary of Association and Commission.)

Project for Lake Front Development of the City of Chicago.—By Eliel Saarín, Architect. In "The American Architect and The Architectural Review" for December 5, 1923. 29 quarto pp. Plans and drawings. A plan for development of Grant Park and its surroundings, "within the limits of the existing and the possible," preserving the landscape features of the park while making it a great through-traffic artery and a parking place. 50 cents. (Apply to the publishers, The Architectural and Building Press, Inc., Stamford, Conn.)



A Barber-Greene Clearing the Streets in Madison, Wis.

Clearing a city block in 15 minutes

In a recent snow-storm in Madison, Wis., a Barber-Greene Snow Loader cleared an entire block in 15 minutes, in some places plowing through drifts 5 feet high. This work would have required two hours for a large gang of men with ten wagons.

Eight of the recent Barber-Greene sales have been to towns ranging from 35,000 to 121,000 population.

This serves to show that the smaller cities, as well as the large ones, are realizing that the swift removal of snow is highly important to business.

From Manchester, N.H., a town of 78,000, the City Surveyor writes: "The machine is doing great work. The only people who are displeased are the one or two hundred shovelers it displaces."

From Duluth, Minn., the Commissioner of Public Works sends this report: "I am satisfied that we can keep our business section clear of snow and reduce our costs on snow removal with the new Barber-Greene. I might add that we loaded six yards of snow in one minute flat." Duluth is a city of 100,000.

In large cities and small, Barber-Greene's are doing away with the expense of large labor gangs, and are eliminating those tie-ups which have always been so costly to business.

Send for the book, "Mechanical Snow Handling," which describes the snow-fighting methods of a number of cities and street railways. And remember—last year the heaviest storms came in February and March.

BARBER-GREENE COMPANY—Representatives in 33 Cities—515 W. Park Avenue, Aurora, Illinois

BARBER  **GREENE**
SNOW LOADERS

Estimates of Population of the United States.—By states and cities, 1910 to 1923, and area July 1, 1922. Prepared under the supervision of Charles S. Sloane, Geographer of the Census, 1923. Containing the estimates of population of the United States, the states and territories, counties, and the cities which had a population of 8,000 or more on January 1, 1920. For use by health officers in states which have an established system of registration of deaths, and by other statisticians who need population data for years subsequent to the census enumeration. 15 cents. (Apply to the Superintendent of Documents, Government Printing Office, Washington, D. C.)

Ten Addresses on Education.—By William L. Ettlinger, Superintendent of Schools, New York City. Published November 12, 1923. 128 pp. The following are the subjects of the addresses: The Life Career Motive in Education; The Teacher and the Development of National Ideals; Americanization; Effective Supervision; Democratizing School Administration; Economy in School Administration; Facing the Facts; The Ethical Standards of the Teacher; Our Junior High School Problem; The American School Program from the Standpoint of the City. These addresses were delivered before associate and district superintendents of the New York City schools and other professional bodies. Apply to the Board of Education, Park Avenue and 59th Street, New York, N. Y.)

Standard Grading Specifications for Yard Lumber.—Recommendations of the Department of Agriculture. Prepared by Edward P. Ivory, Associate Wood Technologist, David G. White, Forest Examiner, and Arthur T. Upson, in Charge, Section of Industrial Investigations, Forest Products Laboratory, Forest Service. Department Circular 296. October, 1923. 97 pp. Many illustrations. Based on information collected during four years of study of this problem by the Forest Products Laboratory. 20 cents. (Apply to the Superintendent of Documents, Government Printing Office, Washington, D. C.)

Commentary upon the Comparative Tax Rates of 177 Cities, 1923.—By C. E. Rightor, Detroit Bureau of Governmental Research. Reprinted from the "National Municipal Review," December, 1923. 10 pp. Tables. Covering 165 cities of the United States and 12 cities of Canada having in excess of 30,000 population. Prepared with the purpose of making available a statement of the total tax burden upon property in each city, in terms of tax rates per \$1,000 of uniformly assessed property. (Apply to the National Municipal League, 261 Broadway, New York, N. Y.)

Place of the Motor Coach in a General Comprehensive Plan for Transportation in Chicago.—Submitted by John A. Ritchie, President, Chicago Motor Coach Co., May 15, 1923. 36 quarto pp. Map, views, charts. A survey of the broad problem of transportation and the type, quality and variety of service which the motor bus is prepared to render in this difficult situation. (Send 3 cents for postage to the Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

City Planning in Buffalo, N. Y.—Second Annual Report of Chauncey J. Hamlin, President of the Buffalo City Planning Association, Incorporated, delivered at the meeting of the Corporation, December 5, 1923. In "City-Facts," published by the Association, January, 1924. 7 quarto pp. Summing up the accomplishments of the city in controlling its development, and presenting the program for the future, with methods of financing it. (Apply to the Association, 110 Delaware Avenue, Buffalo, N. Y.)

Constitutional Tax Exemption.—By Edward S. Corwin, McCormick Professor of Jurisprudence, Princeton University. A discussion of the power of Congress to tax income from state and municipal bonds. Supplement to "National Municipal Review," January, 1924. 20 pp. Maintaining that "What is needed is not further tinkering with the Constitution but an act of Congress assertive of its present powers." (Apply to the National Municipal League, 261 Broadway, New York, N. Y.)

Boston, Mass.—Ninth Annual Report of the City Planning Board, for the year ending January 31, 1923. (Apply to Frederic H. Fay, Chairman, The City Planning Board.)

Cook County, Ill.—Annual Message of Anton J. Cermak, President, Board of Commissioners of Cook County, for 1923. (Apply to the President of the Board.)

Fort Worth, Tex.—Annual Report of the Park Board for the year ending June 30, 1923. (Apply to George C. Clarke, Superintendent.)

Hartford, Conn.—Sixty-third Annual Report of the Board of Park Commissioners, and Fifteenth Annual Report of the Public Cemeteries, for the year ending March 31, 1923. (Apply to George A. Parker, Superintendent of Parks.)

New York, N. Y.—Report of Commissioners of Taxes and Assessments for the year ending March 31, 1923. (Apply to C. Rockland Tyng, Secretary.)

Philadelphia, Pa.—Annual Report of the Bureau of Water, for 1923. (Apply to Fred C. Dunlap, Chief of Bureau.)

On the Calendar of Conventions

MARCH 6-7.—FRENCH LICK SPRINGS, IND.

Indiana Sanitary and Water Supply Association. Annual meeting. Secretary, C. K. Calvert, 1902 North New Jersey Street, Indianapolis, Ind.

MARCH 27.—PUEBLO, COLO.

Colorado Municipal League. Annual convention. Secretary, Don C. Sowers, Boulder, Colo.

APRIL 3-5.—MINERAL WELLS, TEX.

Texas Commercial Executives' Association. Annual convention-school. Secretary, J. E. T. Peters, Ranger, Tex.

APRIL 7-10.—LOS ANGELES, CALIF.

National Conference on City Planning. Annual conference. Secretary, Flavel Shurtleff, 130 East 22nd Street, New York, N. Y.

APRIL 9-12.—ATLANTA, GA.

American Society of Civil Engineers. Spring meeting. Secretary, John H. Dunlap, 33 West 39th Street, New York, N. Y.

APRIL 15-17.—ATLANTA, GA.

Southeastern Water and Light Association. Annual convention. Secretary-Treasurer, W. F. Stieglitz, Columbia, S. C.

MAY 6-8.—CLEVELAND, OHIO.

Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, Mills Building, Washington, D. C.

MAY 7-8.—PARIS, TEX.

League of Texas Municipalities. Annual convention. Executive Secretary, Frank M. Stewart, Government Research Division, Bureau of Extension, University of Texas, Austin, Tex.

MAY 13-15.—ATLANTIC CITY, N. J.

National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 40 Central Street, Boston, Mass.

MAY 19-23.—ATLANTIC CITY, N. J.

National Electric Light Association. Annual meeting. Executive Manager, M. H. Aylesworth, 29 West 39th Street, New York, N. Y.

MAY 19-24.—NEW YORK, N. Y.

American Water Works Association. Annual convention. Address: W. M. Niesely, 153 West 71st Street, New York, N. Y.

MAY 21-23.—WASHINGTON, D. C.

American Institute of Architects. Annual convention. Executive Secretary, E. C. Kemper, The Octagon, Washington, D. C.

MAY 23-24.—MIDDLETOWN, OHIO.

Ohio Commercial Secretaries' Association. Annual meeting. Secretary, Avery G. Clinger, Assistant Secretary, Chamber of Commerce, Columbus, Ohio. 1924—BUFFALO, N. Y.

International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y. Date to be determined at Directors' meeting in Buffalo, April 15.



Fordizing Detroit's Public Works

The use of Ford Cars and Trucks and Fordson Tractors for a wide variety of public work by the city of Detroit is a first class example of Fordizing a municipality.

The fleet of 48 Ford Trucks covers the residential district collecting garbage. These trucks run sixteen hours a day, averaging six loads each, at a cost of \$24.82 a day, including driver's and helper's wages. With 1500 collections daily, the cost is only 1.6 cents per collection, or 42 cents per month, per family served.

Ford One-Ton Trucks haul supplies

for the Board of Education, Fire and Police Departments, Public Lighting Commission, Department of Parks and Boulevards, Department of Street Railways, Water Department—in fact haul materials of all kinds and descriptions for any municipal department at a lower cost than any other truck made.

Ford Cars are used by city inspectors and department superintendents.

For snow removal and general construction work on streets and boulevards, where every-day dependability counts, the Fordson Tractor has proved an ideal unit

Any Authorized Ford Dealer will be glad to help you work out your haulage problems.

To Fordize is to Economize

Ford
CARS · TRUCKS · TRACTORS

News and Illustrations

Items of Interest to City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Why Not Standardize Street and Road Markings?

By Lee Miller

Advertising Manager, The Tropical Paint & Oil Company, Cleveland, Ohio

Every year more motor vehicles are used in this country and, therefore, the regulation of this ever-increasing volume of traffic is becoming more and more of a problem. The great increase in the number of accidents is appalling, and anything that can be done to make motor travel safer is deserving of the most careful consideration. The traffic problem is by no means confined to the large cities, as the great amount of tourist travel in some parts of the country brings small towns and cities a volume of traffic that ordinarily would be found only in cities of considerable size.

One fruitful cause of accidents lies in the fact that tourists are not familiar with the many different markings and warnings that they find along their routes. At present, each town, county and state uses any marks that strike its fancy, and the result is that the tourist never knows just what he is expected to do, and frequently he does the wrong thing and meets with an accident.

Suppose, for instance, that there was a standard road marking in all parts of the country for approaches to railroad crossings, such as the series of warning lines that are used for this purpose in the state of New York. Then tourists running over unfamiliar roads at night would know when they saw these lines that they were approaching a railroad and would take the proper precautions. The same would be true of approaches to dangerous curves, steep hills, crossroads and other points where accidents are apt to occur. Standard markings for all these conditions would make automobile travel much safer than it is at present.

In cities, too, the tourist is often at a loss to know what to do. Perhaps he attempts to turn at a corner where traffic is not supposed to turn, and an accident results. It is not so much the fault of the tourist as it is the lack of standardization, which makes it almost impossible for him to know what to



A NEW METHOD OF CORNER MARKING, FOR USE WITH OR WITHOUT A POLICEMAN

do. If such street crossings were marked in a standard way in every city in the country, then every driver of a motor vehicle would know that no turn should be made at a corner marked in that particular way. This is only an illustration of the many advantages of standardization.

As a step toward standardization, The Tropical Paint & Oil Company has just published a book showing blue-prints of the best street and road markings used throughout the United States. Before this book was printed, a great many different markings were studied and those that seemed to be the simplest and best were given a place in the book. Some special cases may come up that are not covered by any marking in the book, and later revisions will have to be made, but it is at least a start in the right direction. If you would like a copy, write to THE AMERICAN CITY. The illustration above shows one plan of marking which is explained in this book.

City, state and county officials who have charge of street and highway marking will do well to give some serious thought to this matter of standardization. It is one of the things which will be of help in combating the increasing danger of accidents on our streets and highways and, therefore, is highly important.

Safeguard the City's Buildings, the Grounds and the Children with a Stewart Chainlink Protection Fence.



STYLE NO. OT266—All Galvanized

Protection - Beauty - Permanence

THE advanced ideas in construction of the Stewart type of Chainlink Protection fence makes it the ideal fence for municipal water works, sewage disposal plants, parks, playgrounds, golf courses, tennis courts. Made of genuine open-hearth galvanized fabric with interlocking mesh; fittings of pressed or forged steel, it combines protection with beauty and permanence.

We also manufacture Balcony Railings, Grilles, Wire and Iron Window Guards, Bridge Railings, Miscellaneous Wire and Iron Work.



Ornamental Iron Fence and Gates

For forty years we have been leaders in the manufacture of iron fence; hundreds of city and municipal cemeteries are among our thousands of installations. Stewart's Iron Fence and Gates are equally popular for town houses, suburban homes, country estates, and other properties where the highest type of enclosure or entrance gateway is required.

**SAVE MONEY FOR THE CITY BY GETTING
OUR PRICES ON PARK SETTEES.**

Let us know your requirements in either Iron or Chainlink Wire Fence and we will submit designs and estimates of cost

THE STEWART IRON WORKS COMPANY.
216 Stewart Block, Cincinnati, O.

"The World's Greatest Iron Fence Builders"

Refuse Collection Wagons Developed by New American Company

While local regulations or by-laws may govern the methods of collection, the various classes of refuse—garbage, rubbish and ashes—remain constant, and for this reason it is imperative from an operating standpoint that a refuse-collection wagon should be capable of transporting the various classes of refuse in combination or separately. Convertible Wagon-Trailers Inc., 120-218 Amherst Street, Buffalo, N. Y., has developed a roller-type, rear-dump refuse-collection wagon with utility slat sides which makes possible the handling of almost any kind of refuse. The upper portion of the sides of this wagon are formed by hinged slat sides, which are raised or lowered as required.

In the case of combined collection of garbage and rubbish, these sides are dropped when loading is begun, thereby reducing to a minimum the driver's reach in loading and, at the same time, speeding up the work of collection. When the load reaches the level of the solid portion of the body, the slat sides are raised, which gives the wagon a capacity of 4 cubic yards level. For the collection of ashes, the slat sides are not utilized, which reduces the body capacity to 2½ cubic yards. In the handling of heavy ash containers, the drop-side construction is a labor-saver. Whether handling rubbish for incineration, or garbage for reduction or incineration, end-dump is usually preferable, as it enables the wagon to back up to the edge of the dumping floor and throw its load completely into the pit. The dumping angle of these wagons is 45 degrees, enabling them to clear themselves very readily at dumps or incinerators.

In order that municipalities in this country purchasing refuse collection wagons and trailers from Convertible Wagon-Trailers Inc.,

may not have to pay any duty on them, an American company has been organized in addition to the parent Canadian company and will manufacture these garbage and refuse wagons in Buffalo.

A factory building 50 x 175 feet and two stories high has been secured in Buffalo for the manufacture of this equipment. Buffalo was selected because of its convenience as a shipping point to places throughout the United States, and for executive reasons because of its proximity to the Toronto Branch.

New Junior Partner with Metcalf and Eddy

Metcalf & Eddy, consulting engineers, 14 Beacon Street, Boston, Mass., have announced that John Prescott Wentworth, who has been with them since 1911, has been admitted to the firm as a junior partner.

Mr. Wentworth graduated in 1910 from the Massachusetts Institute of Technology and during the following year was an assistant instructor. In July, 1911, he entered the employ of Metcalf & Eddy, with whom he has remained continuously except for his term of military service. He has acted as resident engineer upon a housing development at Hopedale, Mass., on the construction of the sewerage system at Northeast Harbor, Maine, on the supervision, design and construction of a portion of the sewerage system of Lynn, Mass., and in the detailed valuation of several water-works companies. In September, 1917, he was commissioned First Lieutenant in the Sanitary Corps, and was promoted to Captain in 1918, having served as camp sanitary officer in several camps. From 1913 to 1915 he was a member of the Planning Board of the city of Malden, Mass. He has been active in the Boston Society of Civil Engineers, having served as Clerk, Vice-Chairman and Chairman of the Sanitary Section. He is also Editor and Advertising Agent of the *Journal of the New England Water Works Association*.

John L. Ford Joins Ford Meter Box Company

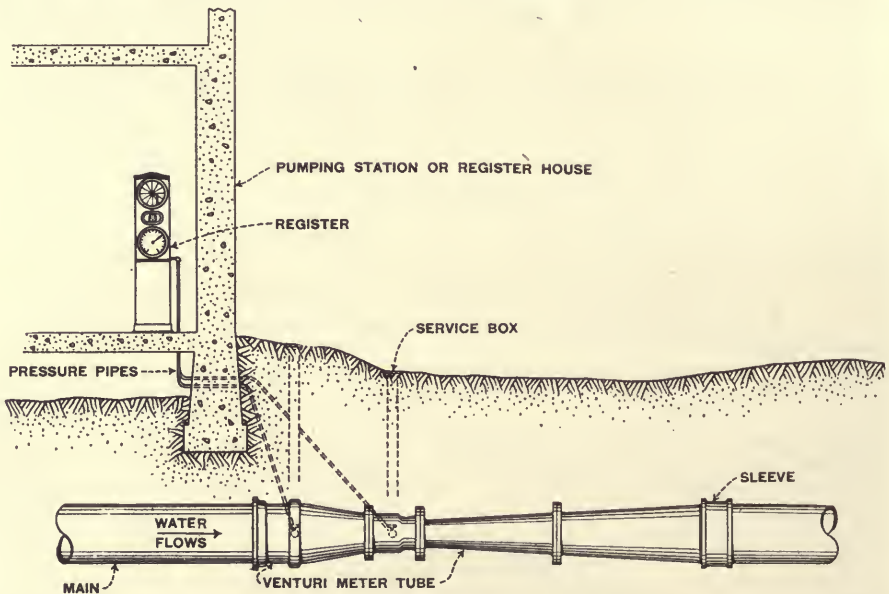
The third son of E. H. Ford, President of the Ford Meter Box Company, Wabash, Ind., has joined that organization as a traveling salesman. John L. Ford graduated in 1920 from Purdue University as a chemical engineer. Immediately after leaving the University, he became associated with the Worthington Pump & Machinery Corporation in its Sales Department, and held that position until January 1 of this year.



A WAGON-TRAILER DUMPING REFUSE AT INCINERATOR

PRESENT CONSERVATION MEANS FUTURE DIVIDENDS

- TO KNOW** the day and night rates of water consumption per capita for each season of the year
- TO KNOW** the amount of abnormal demands on the system
- TO KNOW** the extent and time of occurrence of pipe line breaks and other wastage
- IS VITAL** to a progressive water department



Thousands of towns and cities are planning wisely for the future through the daily records from *Venturi* METERS on the main supply lines

Bulletin No. 209 tells more

BUILDERS IRON FOUNDRY PROVIDENCE, R. I.

"Builders of Venturi for 33 Years"

A Successful Highway Safety Guard

For some time safety nets have been used beneath construction workers and in rescuing people from burning buildings. It has remained for the Page Steel and Wire Company, 215 North Michigan Avenue, Chicago, Ill., to bring out a successful highway safety guard which applies the principle of the aerial life-net to prevent embankment, bridge and curve accidents, which cost the lives of hundreds of motorists annually. The appliance is a ribbon of woven wire so fabricated as to absorb impact. It is designed to replace wooden rails, stone walls and cables along highway danger points. Placed at the top of curves and cliffs and at bridge approaches and sides, it stops skidding and speeding machines that hit it, by the stretch of its fabric without destructive impact and without the ordinarily serious damage to the car or injury to occupants.

Tests of this guard demonstrated that it is impossible for a machine speeding as high as 45 miles an hour to break through it, according to W. T. Kyle, General Manager of the Page Steel and Wire Company. He says: "Forty per cent of highway accidents and many of those in cities result from cars going over cliffs or bridge sides. Highway engineers have for years been searching for a guard to replace wooden rails, which serve merely as a

warning, and stone walls and cables, which, if hit with any violence, break through or wreck the machine because of the impact."

The Highway Guard is built under a method of fabricating wire which gives maximum strength, elasticity and recoil. Machines hitting it at a moderate speed were brought to a stop, the recoil pulling them back from danger. With the machine going at high speed, the meshes, giving uniformly, simply wrap around the hood, allowing the blow to spend itself evenly on the wheels, bumper, etc. Even though the blow might displace a post, in such a case the fastenings farther away hold, and the car is stopped.

In comparative tests conducted before the Connecticut state highway officials with 4,000-pound machines going 20 miles an hour, the guard was only slightly affected and the cars were not damaged. Standard wooden railings hit at the same speed were totally wrecked and the cars went completely through them and were badly damaged.

The guard can be installed in continuous lengths for any distance, and if one section is caused to sag by a blow, that section can be replaced. Sections on either side of the damaged portion are not affected. The guard is galvanized and painted white, making it easily visible at night. It is constructed of 24-inch wire link fabric. The mesh formed



A NEW TYPE OF GUARD FOR DANGEROUS POINTS ALONG HEAVY-TRAFFIC ROADS

THE AMERICAN CITY

Illustration is from an oil painting of King Standard as installed at Kansas City, Kansas.

Richly designed, built substantially—King Ornamental Lighting Standards equipped with General Electric Novalux lighting units—provide a beautiful, economical, efficient system of illumination.



ING MANUFACTURING CO
ORNAMENTAL LIGHTING STANDARDS

230 South Clark St. Chicago USA

by No. 9 wire is square, measuring $1\frac{1}{2} \times 1\frac{1}{2}$ inches. The Ohio State Highway Commission has ordered it installed immediately at a famous "death curve" at Columbus, Ohio, and other state highway departments are including it in their specifications.

One-Ton Trucks with Steel Cab and Truck Body

An all-steel combination truck body and cab mounted on the standard Ford one-ton chassis, which will be sold as a complete unit, has recently been announced by the Ford Motor Company, Detroit, Mich. The new body is of the open express type, so constructed that it may be readily converted into other body combinations by using stakes, sideboards, a canopy top or screen sides. The purpose of produc-

rear vision, adding to the safety as well as the convenience of the driver.

Gordon Becomes Partner of Dabney H. Maury

Dabney H. Maury, consulting engineer, has announced that Fred G. Gordon, formerly his principal assistant, has become associated with him as partner, under the firm name Maury & Gordon. They will continue the practice of hydraulic, sanitary and mechanical engineering, including investigations, reports, designs, estimates and supervision of construction for water-works, water purification plants, sewerage systems, sewage disposal plants, power-plants and water-power developments and the appraisal of public utilities. Their office is at 1445 Monadnock Block, Chicago, Ill.



LIGHT-WEIGHT TRUCK WITH STEEL BODY AND CAB

ing this body, according to the Ford Motor Company, was to place a low-cost general-utility truck meeting both agricultural and commercial requirements at the disposal of the users of one-ton trucks. The body is built of steel to withstand severe use and presents a new development in construction. The steel sills are reinforced with wood, in order to lessen vibration and road shocks, thus making for more durability and longer life. The loading space is 7 feet 2 inches in length by 4 feet in width and of convenient and practical depth. The end gate is strongly braced and secured by heavy chains, which hold it in position when lowered.

The cab, also of steel construction, is extra roomy. The seat is of artificial leather, well-cushioned on 4-inch springs. Protection from the weather is afforded by close-fitting door curtains mounted on uprights and opening and closing with the door. An oblong window in the back of the cab gives ample facilities for

Changes in Hazard Sales Organization

The Hazard Manufacturing Company, Wilkes-Barre, Pa., has announced that Daniel J. Morgan, for several years Sales Agent of the Insulated Wire Department, has been appointed Sales Engineer, with general offices at Wilkes-Barre. Mr. Morgan entered the employ of the company in 1900 and has held various positions with the manufacturing department and sales office until 1917, when he was appointed Sales Agent.

Leroy W. Allen has been appointed Sales Engineer of the New York Office of the Hazard Manufacturing Company and will make his headquarters with that office at 533 Canal Street. Mr. Allen entered the employ of the Hazard Manufacturing Company in 1903 and has been connected with the sales organization of that company in New York, Chicago, and Wilkes-Barre.

Why Montgomery now paves *with native-lake asphalt*



Perry Street, Montgomery, Ala., paved with Bermudez (Native-Lake) Asphalt eleven years ago and still in almost perfect condition. Not a cent has been spent on repairs.

Eleven years old—still in splendid condition—and not one cent spent to date for maintenance or repairs! This is the “service record” of the Bermudez (Native-Lake) Asphalt paving in Montgomery, Alabama.

And that’s why the city of Montgomery is now laying 46,419 additional square yards of Bermudez paving, and why 38,500 square yards are being laid in Cloverdale, a suburb.

Nothing equals the native-lake asphalts—Trinidad and Bermudez—for long-life, low-cost pavements. Thousands of streets and highways all over the world prove it. Write at once for interesting data.

THE BARBER ASPHALT COMPANY PHILADELPHIA

New York, Chicago, Pittsburgh, St. Louis, Kansas City, San Francisco

TRINIDAD and BERMUDEZ

The Native Lake Asphalts

A New Asphalt-Producing Plant

Contractors and highway officials doing a considerable amount of asphalt work will find the Littleford-Pullar asphalt-producing plant of special interest. This plant is a complete unit in itself and produces any kind of asphalt from flux oil. It is capable of producing asphalt for penetration work, asphalt cement for asphaltic concrete or sheet asphalt streets, and asphalt filler for brick work. The plant has been under practical test during the past year and has met with all standard specifications in from four to six hours, which is fully as quick as solid filler can be melted. It is said that the saving in cost to the street department is a considerable item. Asphalt cement for penetration asphalt can be produced in less time and made to meet any of the standard specifications; it is thus only necessary to keep on hand the flux oil instead of the various types of asphalt necessary for different kinds of work. The plant and the method of producing asphalt are so simple that one man is capable of taking care of the entire operation.

This Littleford-Pullar plant was designed by H. B. Pullar, Manager of the Flux and Road Oil Department of the Indian Refining Company, Lawrenceville, Ill. Mr. Pullar is one of the early advocates of blown asphalts and has been intimately associated with the production of this class of asphalt for the last 15 years. He has designed and acted in a consulting capacity for some of the largest asphalt-blowing plants in the country. The simplicity and practicability of this new portable asphalt-producing plant is the result of years of experience in trying to find a practical method of the economical and efficient production of asphalt on the job. Littleford Brothers, 500 East Pearl Street, Cincinnati, Ohio, have the exclusive manufacturing rights

for the plant and will distribute it through their own sales organization.

New Eastern Manager for Graver

The Graver Corporation, East Chicago, Ind., manufacturers of tanks, water-softeners, filters, and general steel plate construction work, have announced the appointment of L. H. Welling as Manager of their eastern office, 5045 Grand Central Terminal Building, New York City.

Water Works Manufacturers Association Committees for 1924

The Exhibit Committee of the Water Works Manufacturers Association, to handle the conventions for 1924, comprises J. E. O'Leary, *Pittsburgh-Des Moines Steel Company*, chairman; J. D. Capron, *U. S. Cast Iron Pipe Company*, Burlington, N. J.; and Charles M. Reed, *Central Foundry Company*, New York City.

The Entertainment Committee of the Water Works Manufacturers Association for the American Water Works Association Convention is as follows: Burt B. Hodgman, *National Water Main Cleaning Company*, New York City, chairman; John S. Warde, *Rensselaer Valve Company*, New York City, vice-chairman; W. C. Sherwood, *Hersey Manufacturing Company*, New York City; E. L. Cantrell, *Neptune Meter Company*, New York City; Charles Becker, *R. D. Wood & Company*, Philadelphia, Pa.; W. R. James, *H. Mueller Manufacturing Company*, New York City; and Theodore R. Kendall, *THE AMERICAN CITY*, New York City.

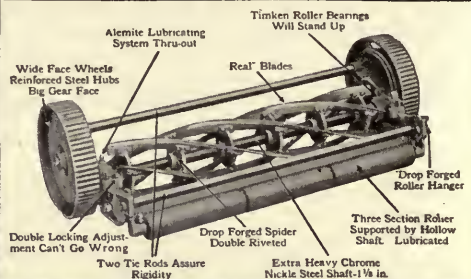
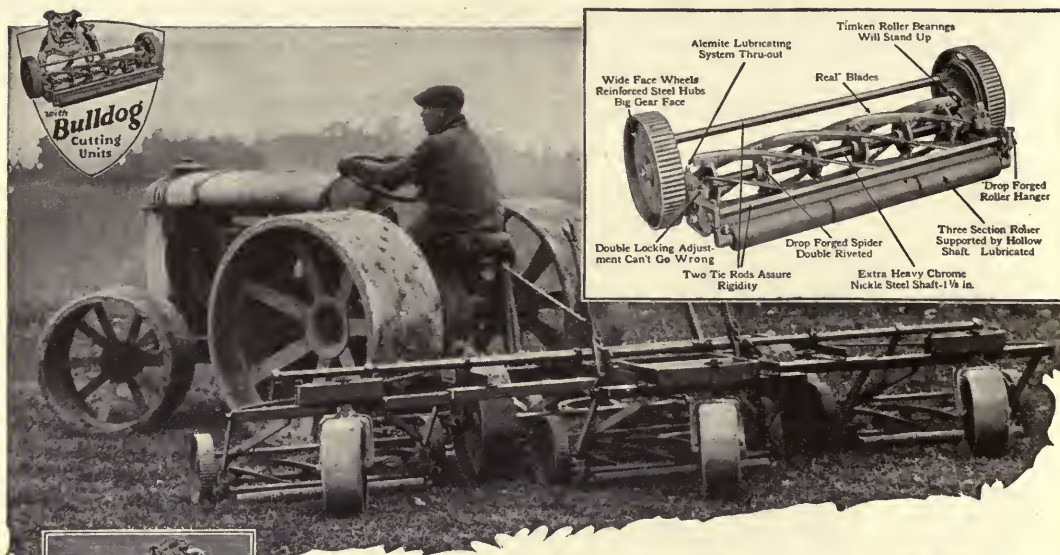
Increased Prices for Liquid Chlorine and Bleach

The Mathieson Alkali Works, Inc., 25 West 43rd Street, New York City, has announced an advance in prices for liquid chlorine and bleaching powder, f. o. b. Niagara Falls. Bleaching powder for spot sales and contracts for future delivery in car-load lots shipped in 700-pound drums is \$1.75 per 100 pounds, and \$2 per 100 pounds in 300- and 400-pound drums. Shipments in less than car-loads not on contract are 15 cents per 100 pounds above these prices. Liquid chlorine for spot sales and contracts for future delivery in tank-car lots and cylinders, f. o. b. Niagara Falls is \$4 per 100 pounds in single units or multi-units, \$5 per 100 pounds in cylinders in car-load lots, \$5.50 in cylinders for sales of more than one ton, and \$6 per 100 pounds in cylinders for sales of one ton and less.



REAR VIEW OF THE NEW LITTLEFORD-PULLAR BLOWN-ASPHALT MACHINE





Golf Clubs Demanded Them —Here they are—

"Bulldog" Cutting Units for Tractor Hitch

There's seldom a day when we don't get letters saying that Ideal "Bulldog" cutting units give two, three and four times the service given by any other unit without adjustment or repairs. In just three years their sturdiness has become the wonder of the grass cutting field.

So outstanding is this superiority that we have received hundreds of requests to furnish them for tractor hitch, in addition to use on the Ideal Mowers for which they were originally designed. Golf clubs demanded them—here they are.

The new Ideal "Bulldog" Mower—3 and 5 units—is designed for use with the Fordson or any other tractor, or can be furnished horse-drawn. It has many outstanding features. First there is the "Bulldog" cutting units, with their Timken bearings, Alemite Lubrication, patented double-locked adjustments, special alloy steels and proven sturdiness. Second, these units are *pushed* individually, as they should be. Third there is no weight on the units themselves. Fourth the short turning radius and fifth the ease with which the units are raised.

Ideal "Bulldog" Mowers will give continuous performance beyond your fondest hopes. If cutting unit failure has given you trouble in the past—here is its end. Write for details.

Ideal Power Lawn Mower Company

R. E. Olds, Chairman

400 Kalamazoo Street, Lansing, Michigan

NEW YORK, 13-19 Hudson Street

CHICAGO, 11 East Harrison Street

Dealers in all Principal Cities

(82)

IDEAL *Bulldog* MOWERS

3 and 5 Units

A Shelter for Traffic Officers

The portable shelter for traffic officers described on page 235 of the February, 1924, issue of *THE AMERICAN CITY*, is manufactured by J. A. McKelvy & Company, Harrisburg, Pa.

Sludge Conveyors for Sedimentation Tanks

The township of Pensauken and the borough of Merchantville, N. J., have recently installed a joint sewage disposal plant. Pensauken needed a sewage disposal plant and was considering the installation of a new treatment plant, and the borough of Merchantville was experiencing a serious overload in its old septic tank. Through the efforts of the consulting engineers, the two communities decided to combine their resources and build a community disposal system, furnishing immediately increased disposal facilities for both communities, a plant that would care for future requirements, the utilization of the old septic tank then in use, and economy in construction costs.

The sedimentation tanks for the new disposal plant were started on the site of the old septic tank. The plans make use of the old septic tank for the digestion of the settled solids. Link-Belt sludge conveyors are employed in the new sedimentation tanks to move the settled material into sludge hoppers, from which it is periodically withdrawn into the digestion tanks. These conveyors make possible the use of long and comparatively shallow settling-tanks, which are not only highly efficient and low in construction cost, but also particularly advantageous in this instance in that to excavate deeper would mean to enter quicksand, thus incurring high expense in the

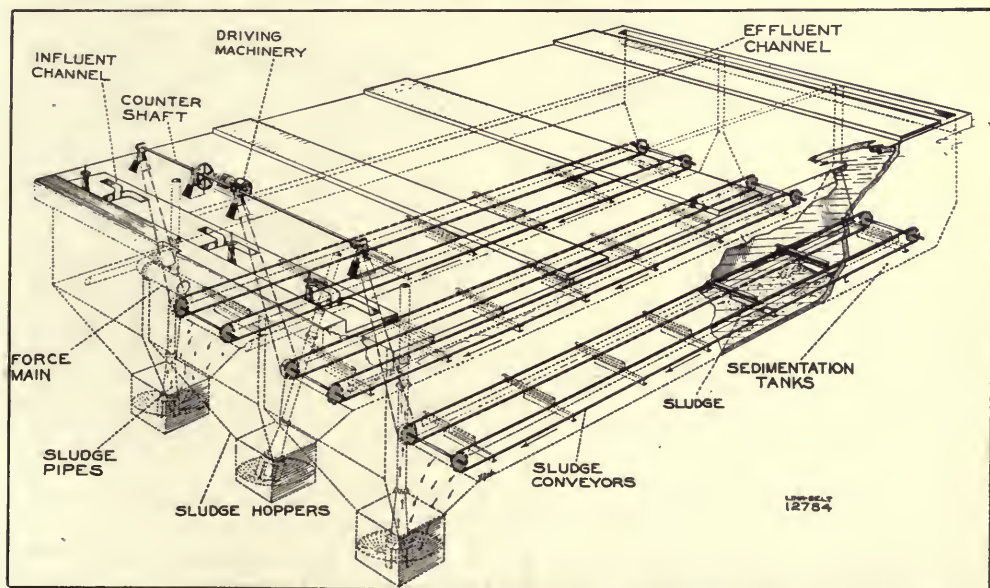
building of a foundation. The conveyors and all driving machinery were supplied by the Link-Belt Company, Philadelphia, Pa.

Power-Plant Consultant

Theodore Maynz, who for the last four years has been in charge of the Testing, Efficiency and Results Department of the Cleveland Electric Illuminating Company, Cleveland, has severed his connection with that company and is now prepared to give consulting service on the utilization of fuel and the generation and application of steam and electric power in all its phases. Mr. Maynz was formerly connected with the Interborough Rapid Transit Company, of New York City; the Combustion Engineering Corporation, of New York; the Federal Light and Traction Company, of New York; and the Gulf Oil Corporation, of Texas. His address is 3326 Kenmore Road, Shaker Heights, Cleveland, Ohio.

New Plant of Chicago Concrete Post Company

Since the Chicago Concrete Post Company, Lawrence, Lamon & Leland Avenues, Chicago, Ill., reorganized last May, the former stockholders have been bought out completely, so that the company is no longer connected financially or otherwise with any contracting company. The capitalization has been greatly increased and the manufacturing capacity enlarged to 100 concrete poles per day. Arrangements have been made with the Western Electric Company for the distribution of Chicago concrete lighting standards throughout the United States. Paul K. Fleming, President, extends a welcome to engineers to inspect the plant and the particular process of manufacture used in making Chicago ornamental concrete lighting standards.



SLUDGE CONVEYOR IN COMMUNITY SEWAGE PLANT

Milwaukee's Parks Are Kept Beautiful With 16 Jacobsen 4-Acre Power Lawn Mowers

The first mower sold the other fifteen because it enabled one man to do the work of 4 or 5 men with hand mowers—do it better and cheaper.



Trouble-free, dependable performance; easy steering and close-up work about flower beds, trees, etc., made possible by Automobile type of differential in the Jacobsen; powerful, specially built motor; self-sharpening reel; independent clutch control on wheels and cutting unit—these and other distinctive features make the Jacobsen 4-Acre Mower a favorite with the municipal park boards. The Jacobsen soon saves its own purchase price.

Write for Free Book "Lawns Beautiful"

Describes the mowers in detail, pictures many beautiful lawns and gives the experiences of users.

JACOBSEN MFG. CO.
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Special Putting Green Mower For Municipal Golf Courses

Let us show you how to have faster greens at 50 to 75 percent lower cost.

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Portable Kettles 50 to 900 Gallons
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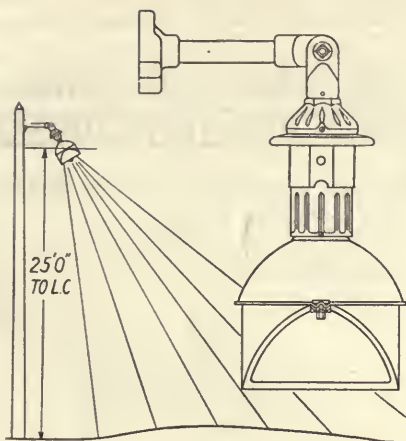


The BARTON Portable Pumper Is Equipped with Automatic Primer

Eliminates all priming trouble and gives the pump a capacity of from one to four hundred gallon per minute.

Write for complete information

BARTON PRODUCTS COMPANY
JACKSON, MICH.



SKETCH AND DIAGRAM OF HIGHWAY LIGHTING UNIT

Lighting Interurban Highways

The proper lighting of highways is accomplished by providing a clear view of the whole roadway a considerable distance ahead of the car and eliminating glare within the range of vision of the driver.

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has developed a highway lighting unit which consists of a porcelain housing containing a series socket for a Type C Mazda lamp, a reflector and a double set of refracting prisms. The units arranged for suspension from a series of interchangeable fittings to be fastened to brackets, mast-arms or span-wires as mounting conditions require. The reflector is made of copper, highly polished and lacquered on the inside. Its shape is parabolic and so arranged with relation to the refracting prisms that all of the light is thrown in a direction parallel to the roadway. Most of the light is controlled by the upper parabolic reflector, which redirects the rays vertically downward upon the two sets of refracting prisms and thence to the road surface in the two directions in which it is most needed.

New Yeomans Offices

Yeomans Brothers Company, 1417 Dayton Street, Chicago, Ill., has announced the establishment of two new district sales agencies. The northwestern Ohio territory is to be covered from the new office at 752 Euclid Avenue, Toledo, Ohio, in charge of A. Carle Rogers. The central and northwestern Washington territory is to be handled from the new office at 2021 L. C. Smith Building, Seattle, Wash., by the Godfrey Jones Company.

Wire for Police and Fire-Alarm Circuits

Overhead circuits for police and fire-alarm service must consist of weather-proof wires, possessing safety, moderate cost and proper electrical properties. Reliability and uninterrupted service are the foremost requirements of overhead wires of every police and fire-alarm system. Comparing the cost of the wires with the value of life and property which they protect and with the important duties they must perform, it is evident that consideration of reliability every day of the year, in winter as well as in summer, must have precedence. Fire and police department records show that apparatus is called out most frequently after sleet or wind storms, which indicates that service is needed when the wires are most liable to be broken.

Municipal engineers who have been using copper or iron wires on overhead lines and who contemplate making new extensions or replacements may secure some helpful information from the loose-leaf book of the Copper Clad Steel Company, Braddock P. O., Rankin, Pa., entitled "Engineering Data — Copperweld." When the electrical properties of an overhead wire are known to be satisfactory for a given alarm circuit, the question of cost may be ranked next in importance to that of safety. It is claimed that Copperweld weather-proof wires cost less than copper or iron wires, even on the basis of first cost of material, and show a saving in ultimate cost.

On loops of certain lengths, Copperweld overhead line wire does not require any greater number of battery cells than solid copper wire requires. Such loops when strung with solid copper wire must have an excess resistance in the line, usually in the adjustable rheostat to keep the current down to proper value. The use of Copperweld wires in such cases does not involve adding any cells, but merely requires eliminating some excess resistance in the adjustable rheostat. On very long loops, a few extra cells may be required when using Copperweld instead of solid copper. The additional cells may be fully justified by the greater safety and reduced maintenance cost of the overhead wire system.

Sullivan Moves Birmingham Office

On February 1, the Birmingham, Ala., office of the Sullivan Machinery Company, 122 South Michigan Avenue, Chicago, Ill., was moved to 2108 Fifth Avenue, North, Birmingham, Ala., where ample floor space provides more adequate accommodations for the company's business than the former quarters in the Brown-Marx Building. G. P. Small is local manager for Alabama.

Manufacturers of fire apparatus and any other equipment or material tending to reduce fire waste are invited to send communications to James J. Mulcahey, Secretary of the International Association of Fire Engineers, Room 301, City Hall, Yonkers, N. Y., so that a discussion may take place at the meeting of the Board of Directors at the New Statler Hotel, Buffalo, N. Y., April 15, 1924, for the purpose of making a special educational feature for fire chiefs and the general public, leading to greater prevention of our fire losses.

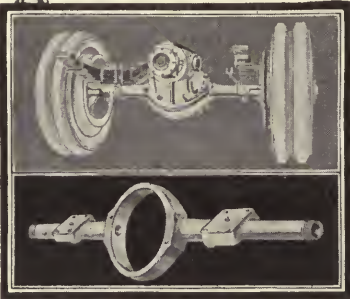
—William H. Bywater, President, International Association of Fire Engineers.

Exclusive Features



No. 22
The Dual
Reduction
Drive.

No. 23
The One-
Piece Banjo
Type Axle.



THE Mack Dual Reduction Drive is a more efficient drive than either the worm or internal gear. The gears all have a rolling contact and are grouped together and held in alignment by a single solid carrier. The axle proper gives greater road clearance than the worm drive and not only are gear ratio changes made more quickly, but a greater range of changes is possible than in the case of any other type of enclosed drive truck axle.



The Mack One-Piece Banjo Type Axle is forged from a single bar of chrome nickel steel and is then heat-treated, machined and finished. It extends from hub cap to hub cap and is the largest drop forging produced in the automotive industry. Riveting, shrinking and bolting are unknown in Mack banjo axle construction.

The 27 exclusive features are the result of 23 years of specializing in motor transportation. Each one has played an important part in building the reputation which Mack Trucks have established wherever motor trucks are known.

Send for illustrated and descriptive literature on all exclusive Mack features.

INTERNATIONAL MOTOR COMPANY
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IN CASE OF FIRE DANGEROUS STREET CORNERS

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Type "F"

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"FIRE" to everyone.

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ROCHESTER 53 Allen Street, NEW YORK

HUBER ROADTOOLS MAINTAINERS - ROLLERS

The Huber Four Cylinder Gasoline Roller starts easily, has surplus power and convenient to handle. Air controlled scarifier folds under when not in use.

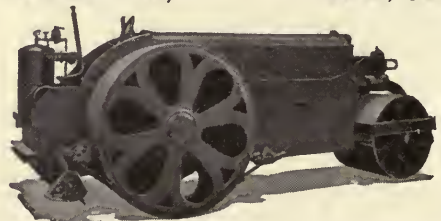
The Huber Steam Roller has been standard equipment with road builders for many years. Always dependable. The Huber One-Man Road Maintainer is economical and the four cylinders furnish excess power. Has weight enough to hold blade down when making heavy cut and pulls a detached grader when necessary.

Write for illustrated folders
on any Huber Road Tool.

THE HUBER MFG. CO.

106 Center Street,

Marion, Ohio



Vol. XXX
No. 4

The American City Magazine

APRIL
1924

443 Fourth Ave.
NEW YORK

50 Cents
\$4 a Year

Civic and Social Forces in Giant Power

"No force of nature which man has mastered can do so much as electricity to lift the burden of drudgery from the shoulders of mankind."

FORECASTING social changes as sweeping as those ushered in by the industrial revolution, the *Survey Graphic* has performed a public service of the first importance in making its March number a "Giant Power" issue. Public officials, engineers, bankers, manufacturers, labor leaders, social workers and others have here collaborated in discussing the social, civic and economic forces inherent in the coming conversion of our great primary energy resources into electricity, their regional pooling, and their integration into a nation-wide federation of systems. From this sheaf of articles, representing a year's scouting on what the editors well describe as the borderland between experience and prophecy, the following excerpts are taken.

Gifford Pinchot

Gifford Pinchot, conservationist and governor, conceives of Giant Power as a social force unshackling our people for the Great Adventure:

"As in the storybooks of our childhood, a giant—Giant Power this time—is about to do wondrous things for the human race. From the power field perhaps more than from any other quarter we can expect in the near future the most substantial aid in raising the standard of living, in eliminating the physical drudgery of life, and in winning the age-long struggle against poverty. One of the most pronounced and untoward effects of the industrial revolution with its mechanical power was the massing of population in urban centers. If, under the Giant Power dispensation, mechanical energy can not only be made cheap but dis-

tributed broadly, authorities agree in predicting spreading out of population—a veritable 'back to the land movement.'

Herbert Hoover

The medley of local clashes and Federal oversights that will be ushered in by the development of transcontinental arteries of power transmission are discussed in an interview with Herbert Hoover by William Hard. It is pointed out that the problem is one in which the Federal Government must inevitably play an important part, because of its positive power over navigable streams and its negative power over interstate agreements:

"As the immediate sovereign over all navigable territorial waters of the United States, whether those waters lie along the seacoast or extend inward into the territories of the several states of the Union, the Federal Government is obliged to undertake the responsibility of permitting or of preventing the erection of dams and of accompanying power-plants in streams to which the attribute of navigability is conceded by the facts or, at any rate, by the courts. With this responsibility there comes naturally the further responsibility of seeing to it that such dams and such accompanying power-plants are erected in harmony with the general public interest and in harmony accordingly with some reasonably comprehensive plan of ultimate complete 'Giant Power' development.

"The second Federal function here indicated springs from Article 1, Section 10, Clause 2, of the Constitution, wherein it is stated that 'no state shall, without the consent of Congress, enter into any agreement or compact with another state.' Interstate agreements, therefore,

in the matter of electric power cannot come into binding force without Federal permission; and it would seem to follow that this permission should not be granted unless the agreements in question conduce to the public welfare by being in harmony with a well-considered electric power development program."

Philip Cabot

As a banker and public utility operator, Philip Cabot visualizes high-tension electrical transmission as the "logical next step" of a privately owned public utility which has its roots in local enterprises and has the history of the railroads as a precedent and forewarning.

He projects "a structure like a system of national highways connecting the great cities in the several states, from which radiate the local roads to the farms and villages under local control." He would rigorously separate both in corporate identity and government regulation the interconnecting high-power transmission companies from the local distributing systems and central stations; put the former under Federal license to sell power to the latter and only to them; leave to the states rate and service regulation of power sold by the latter to the consumers; and thus avoid "the multiplicity of conflicting controls."

That the rapidity of Giant Power development will be dependent upon wise political action is emphasized by Mr. Cabot:

"In the point of development where we now stand the small isolated plant and the small central station have almost disappeared, being absorbed by large central stations from which alternating current at high voltage is sent out to substations 50 or 100 miles away, where the voltage is reduced to a modest pressure and all the needs of the local communities for light,

heat and power are supplied. In some parts of the country current is now transmitted 200 or 300 miles. The business of these central stations and distributing systems is not as a rule interstate business. The majority of them are confined to one or two states under control of state regulating commissions which fix rates and conditions of service. Interstate commerce of this character is not now extensive, but, as the next step in advance will make it so, this feature is the most critical of all. If it be wisely dealt with, progress will be sound and rapid; if not, progress may be long delayed."

A Challenge to Human Engineering

The importance to city planners, municipal officials and civic workers of the new force inherent in Giant Power is too little realized. As Robert W. Bruère well says:

"The human engineers have worked out no large plans for the distribution of population and the spiritual enrichment of community life comparable to those which the mechanical engineers have developed for the production and distribution of mechanical energy. They have been content to be camp followers rather than patriots in their own right, Red Cross workers to the captains of industry rather than co-equals in community building.

"Through the development of the electrical industry the mechanical engineers are reconstructing the material foundations of America; the human engineers are hardly aware that a new technical revolution is on. And the few that are rest under the romantic illusion that large-scale electrical development means only the harnessing of our streams; they have yet to realize that for the greater part of industrial America, giant electrical power must be coal power."

Sir Adam Beck

Ontario's remarkable experience over a fifteen-year period in uniting more than 380 municipalities in a joint investment of some \$250,000,000 for the distribution of electrical energy to their citizens at unprecedentedly low rates is described by Sir Adam Beck, Chairman of the Hydro-Electric Power System of Ontario. In commenting on this article the editors say:

"When Sir Adam Beck complied with the request of the editors of *The Survey* for an authoritative statement on the work of the Hydro-Electric Power Commission of Ontario, we counted ourselves

tremendously fortunate. For here is an agricultural and manufacturing region—without natural coal resources—which has developed energy from rapids and waterfalls as has no other district in the western hemisphere. Here the issue of public control and development has been removed from the realm of theory to that of practical results; to be weighed and judged thereby. Here hamlet and countryside as well as factory center have felt the stirrings of a new day; and, moreover, here the city, town, village and smaller municipality have borne the work of constructing and operating a vast hydro-electric undertaking on a cooperative basis. Sir Adam sets forth from the standpoint of the Commission how 380 such cooperating municipalities receive electric light and power 'at cost' and own or are constructing

plants capable of an aggregate development of a million horse-power."

Samuel Gompers

Labor's vision of the possibilities of forethought in Giant Power development is set forth by the veteran President of the American Federation of Labor, Samuel Gompers:

"We are in the fortunate position of having one great industrial development so shaping itself that we may be in advance cognizant of its coming and in a position to take intelligent action in regard to its development. We, as a people, shall be foolish indeed, if this tremendous development is allowed to roll its great weight upon us without any action on our part looking toward its control and direction. We have before us an opportunity to take one great engine and compel its course so that it shall be to the largest possible extent a well-balanced social asset, instead of an engine run primarily for profit and only secondarily for service.

"Surely human intelligence is capable of something better than the railroad muddle in the development of power. Surely it is capable of something better than the muddling of the mining industry. There has yet grown up no fixed tradition in Giant Power. There is no dead hand upon the project. There is here the opportunity for control that will function for the good of the industry itself and for the good of industrial life in general. There is every reason why there should be erected for the coming power industry a democratic organization for the operation of that industry."

Morris L. Cooke

That consumer's rates for electric current—especially for small users—are of the essence of any discussion of Giant Power and its possibilities, is the opinion of Morris Llewellyn Cooke, Director of Pennsylvania's Giant Power Survey:

"We believe that electrical technology has advanced to a point where the use of current can be made so inexpensive as to revitalize the whole social fabric. The willingness of the

private agencies occupying the field to meet proper social requirements will be assumed.

"Present rate schedules bear heavily on the small user—especially on the householder—as contrasted with the large industrial user. The spread appears to be too great between the classic rates now charged for domestic use—15 cents per kilowatt-hour in rural districts and 10 cents in most urban districts except the largest—and the rates charged the largest industrial users—one cent and sometimes below that figure. These typical American spreads between high and low prices, frequently 20 to 1, are very much greater than those encountered in other countries. No such range in price is encountered in the rate schedules of our relatively few publicly owned electrical enterprises, such as those of Cleveland, Ohio; Los Angeles, Calif., and Seattle, Wash. Rate increases, quite general since 1914, have been applied almost exclusively to current used for industrial and commercial purposes and therefore have tended to reduce this discrimination. Because of the unnecessarily high rates for home use, we have not begun to see that wide-spread electrical development in the domestic field which will follow when rates are freed from this type of discrimination.

"The student of electric rates will be surprised at their complexity and especially at the lack of uniformity in the tariffs of companies doing a comparable business. These and other aspects of the current system of electric rates will require study and standardization as essential features of any Giant Power program.

"The electric industry was never more alive than it is to-day. It is probably as free from retarding tradition as any industry, and it is attracting to its service a personnel highly educated along technical lines. While it is becoming more and more subject to the inertia that goes with the unification of policy over wide areas, the incentives for experimentation and fluidity of practice are greater to-day than ever. On the adjustments of these opposing forces of inertia and progress the future of the industry appears to depend. The degree to which social vision is used in adjusting this conflict will largely determine the outcome of the decision as to public versus private ownership."

Benefits from Tax-Exemption of New Housing

THAT partial tax exemption of new housing is creating in New York City aggregate taxable values to an extent heretofore unknown in the history of any municipality, is the opinion of the Commission of Housing and Regional Planning of the State of New York, as expressed in a report made on March 14 to the Governor and Legislature. In stating this, the Commissions says:

"From the increased taxable value of the land the city is already drawing benefits in larger taxes. From the tremendous increase of taxable values in improvements, the city will derive benefit in a few years. The im-

mediate outlay which the city will have to make in added requirements for fire and police protection, for schools, for sewers and other services is relatively small. In the future the city will be repaid for any immediate outlay."

Among other benefits stated by the Commission are that tax exemption was the principal factor in breaking the deadlock in housing construction in 1921; that it has served as an incentive to the building of large numbers of houses of moderate cost, and that by reducing the annual payment required in the purchase of a house, construction for home ownership has been greatly stimulated.

Lake Promenades and River Banks of Swiss Cities

(For these four views and the one shown on the front cover of this issue, THE AMERICAN CITY is indebted to the New York Office of the Swiss Federal Railroads)



THE HARBOR OF GENEVA, SWITZERLAND, PRESENTS A SPECIALLY ATTRACTIVE PICTURE IN SUMMER WITH ITS FAMOUS BREAKWATER (JETEE), ON WHICH A FOUNTAIN WITH A JET 295 FEET HIGH PLAYS ON SUNDAYS AND HOLIDAYS



BEAUTIFUL MONTREUX ON THE LAKE OF GENEVA, WITH THE DENT DU MIDI IN THE BACKGROUND

Swiss cities and resorts maintain Official Inquiry Offices, part of whose function is to help develop and beautify their locality in accordance with modern requirements. Hotels, stores and other business concerns support these so-called Verkehrs-und Verschönerungsvereine, or Sociétés de Développement, by yearly contributions, the municipality helping out with the rest.



BERNE, THE CAPITAL OF SWITZERLAND. THE GOTHIC MUNSTER AND THE FEDERAL PALACE WITH ITS CUPOLAS ARE WELL IN EVIDENCE. THE PHOTOGRAPH SHOWS WATER BEING DIVERTED FROM THE RIVER AAR FOR POWER PURPOSES



BRIDGE LEADING TO THE ZURICH RAILROAD STATION. THE SWISS NATIONAL MUSEUM IS SEEN AT THE RIGHT, NEXT THE STATION

Who Shall Determine the Amount of the City School Budget?

By J. R. McGaughy

Assistant Professor of Education, Teachers College, Columbia University

THE typical American city is expending upon its public school system between 35 and 40 per cent of its total receipts from local taxation. In practically every city the expenditure of this money is in the hands of a board of education which is held responsible for the relative success or failure of the system of public schools in that city. There has been a great deal of controversy as to whether or not this board of education shall itself determine the amount of its annual budget. Boards of education which are free to decide the total amount of money which shall be expended upon the schools each year, subject only to legal limitations imposed by state law or their own city charter, are known as independent boards.

Those boards of education whose annual estimates of expenditure may be revised and reduced by some municipal authority, such as the mayor or a board of estimate, are known as dependent boards.

There are several American cities whose boards of education are not independent, as the term is here defined, nor are they dependent upon *municipal* control of the amount of their annual budgets. The annual estimates of these boards are subject to reduction by some county or state authority, or must be passed upon in a "town meeting." In the study which is to be reported in this article such boards of education have been classified as special boards.

A majority of the specialists in municipal administration have been insistent that the amount of the school budget should be dependent upon municipal control. They conceive of public education as a department

of the municipal organization. Accepting this premise, they argue most logically that the public schools should compete with other municipal departments, such as police and public works, for a share of the limited amount of revenue available for carrying on all governmental functions. They insist that some central municipal authority should be responsible for the apportionment of this total amount among the various de-

partments of the municipal organization.

Almost without exception, the specialists in public school administration take a very different stand as to proper municipal organization. The courts have repeatedly ruled that public education is a state function. Even though the state may legally

Two Groups of Cities Compared

The conclusions here presented as to the fiscal and educational results secured by independent and dependent boards of education, are based on data recently secured by the writer from 377 cities. The two groups of cities were compared on the basis of their expenditures for school purposes and of the distribution of those expenditures among the various functions of a school system; on the basis of their practice in financing public education, and on the basis of certain educational results achieved.

delegate its responsibility to individual cities, educational authorities argue that such delegation of authority is most unwise, that it makes the city school system a football of politics, and that sound theory demands that the people of each unit of the state choose a board of education which shall be directly and solely responsible to them in the administration of their public school system. They contend, further, that a board of education is primarily an agency for determining school policies, and that a city government really supplants the board in its primary function if it be given the power, through control of school funds, to decide whether a given school policy shall be put into effect.

With these two conflicting theories of municipal organization widely held and ably defended, it is not surprising to find great variation in practice in determining the

amount of the annual school budget in American cities.* In approximately half of the cities of over 8,000 population in 1920 the boards of education are fiscally independent, one-fourth are dependent upon municipal control, and the other one-fourth fall in the special group. They range all the way from cities like St. Louis, whose boards are completely free to determine their school budgets, to certain Eastern cities, such as Baltimore, whose school budgets must be passed upon, and may be reduced, by three or more different municipal authorities.

Until very recently there has been no fact basis for determining whether there were significant differences in the fiscal and educational results secured by independent and dependent boards of education. The whole controversy between the opposing camps of specialists was of necessity carried on in a welter of conflicting guesses and opinions.

The writer has recently completed a study of fiscal independence of boards of education based on complete data secured from 377 cities of more than 8,000 population in 1920.† The outstanding findings of this study are here reported. The conclusions presented are based upon a comparison of the averages for independent boards and for boards dependent upon municipal control. The statistical technique for determining the reliability of the difference between two averages was used. A difference between the two groups of cities is reported as real or significant only on condition that the chances are less than one to forty-six that this difference would disappear or be reversed if absolutely accurate data were available for every city properly belonging in either group. The application of so rigid a test of reliability insures the highest degree of validity for all conclusions here presented.

The most important fact which is proved by this study is that fiscal independence has not resulted in increased expenditures for schools. The average total expenditure per pupil in attendance in independent cities was \$83.28; in the dependent cities it was

\$84.29. The statistical technique used shows that this difference of one dollar per pupil is not significant and does not justify the conclusion that total expenditures are higher in cities whose school budgets are determined by municipal authority. This lack of difference in total school expenditure is a conclusive answer to those who have feared that fiscal independence would lead to extravagance. Most clearly an adverse decision concerning fiscal independence may not be justified on the ground that it would result in heavier expenditure for school purposes.

Although cities having independent and dependent boards of education spend the same amount per pupil, on the average, there are marked differences in the proportion of this total which they devote to the various functions of expenditure. Independent cities spend larger amounts per pupil on general administration and on all those functions which have to do with the maintenance and adequacy of school buildings and playgrounds. Dependent cities, on the other hand, spend larger amounts per pupil for the salaries of teachers, supervisors and principals. It is not surprising, perhaps, that a city government whose continuance in power is dependent upon the number of votes which it can muster, should encourage the spending of money most freely in salaries for personal service, and should tend to neglect school buildings and playgrounds.

Cities with dependent boards of education are much more inclined to incur bonded indebtedness for all municipal purposes, but independent cities have higher tax rates for school purposes. The two groups of cities expend the same amount per pupil for school purposes and raise the same proportion of their total receipts through local taxes. All of these facts taken together indicate that dependent cities tend to incur long-term indebtedness and thus pass on part of their financial burden to the next generation, while independent cities tend to pay as they go, to a much greater degree. Another essential difference in the financial practice of the two types of boards of education is shown in their reaction to the emergency occasioned by the rapid increase in the cost of living during the recent war: independent boards increased teachers' salaries more nearly in proportion to the in-

*For a complete discussion of this variation among cities see Frasier, G. W., "The Control of City School Finances," Bruce Publishing Company, Milwaukee, 1922.

†McGaughy, J. R., "The Fiscal Administration of City School Systems," published as a bulletin of the Educational Finance Inquiry Commission, Macmillan, 1924.

creased cost of living during the six years preceding 1919-20 than did the dependent boards of education, the salaries paid by the independent boards having been even lower proportionately prior to the war than at present.

Certain differences in the educational results secured by the two types of boards were also discovered. Cities with independent boards are more successful in keeping their sixteen- and seventeen-year-old children in school, provide a greater amount of playground space per pupil, and have a greater percentage of their pupils in school on full-time schedules. A smaller percentage of their pupils are housed in basements, corridors, attics and portable buildings. On the other hand, cities with dependent boards of education have a greater percentage of women elementary teachers who have had six years or more of training above the eighth grade. This fact is probably a direct result of the higher salaries paid to teachers in these cities.

Specialists in educational administration agree that the most efficient boards of education are made up of a small number of members each of whom is elected from the city at large on a non-partisan ballot for a comparatively long term. Dependent boards of education have a greater number

of members, their members are chosen for shorter terms, and a much smaller percentage of them are elected at large on a non-partisan ballot.

The facts here presented constitute the available evidence to be taken into consideration in answering the question, "Who shall determine the amount of the city school budget?" If the board of education is made dependent upon some municipal authority which shall determine how much may be expended each year on the city school system, it seems fair to forecast that teachers' salaries will be higher, that the teachers employed will have more years of professional training and that the school tax rate will be lower. If the board of education is given independence from municipal control of its annual budget, it seems equally fair to predict that less bonded indebtedness will be incurred, that more adequate school buildings and playgrounds will be provided, that more children will remain in school after the age of compulsory attendance has been passed, and that the public schools will be more successful in meeting economic emergencies which may occur.

The answer to this question will in no way affect the total amount of money which will be expended for public school purposes.

Public Recreation Referenda in Illinois and Iowa

THE most intensive effort to promote public recreation undertaken in a limited area of the country in recent years is on in Illinois and Iowa. Within the year about 35 cities of less than 150,000 population plan to put to vote the question of establishing public recreation systems. The Playground and Recreation Association of America, with headquarters at 315 Fourth Avenue, New York, has sent a number of its best field workers to assist in the educational work.

Amendments to the state recreation laws passed at the last sessions of the Illinois and Iowa Legislatures have been responsible for this wide-spread interest of cities in providing recreation centers and recreation leaders. The amendments have made the laws many times more practical and effective. They make it possible for cities to use existing land and building facilities for the establishing of recreation centers, or to lease such facilities at a nominal sum. It is no longer necessary to purchase special properties for playgrounds and recreation centers.

In Illinois the cities have been given power to levy a special tax not to exceed 1-3 mills for

the establishing and maintenance of a playground and recreation system. This tax, once voted, is available year after year unless revoked or changed by a majority vote of the people. In Iowa, tax funds up to 2 mills have been made available for use in maintaining recreation grounds, including the employment of workers.

Of particular interest are the initiative features of the new laws. They provide that upon petition of a small percentage of the qualified voters (10 per cent in Illinois and 15 per cent in Iowa), a town or city must submit the playground and recreation proposition to vote at the next general election or at a special election. In Iowa the proposition may also be submitted on vote of the city council, so it will not in many cases be necessary to get up a petition.

Chambers of commerce, organized labor, the churches, the women's clubs, agricultural associations and other important organizations in both states are backing the campaign. Local juvenile courts and reformatories are testifying to the value of directed play in decreasing child crime.

The Design of Swimming Pools as to Operation and Sanitation

By Jack J. Hinman, Jr.

Associate Professor of Sanitation, University of Iowa; and Chief, Water Laboratory Division, Iowa State Board of Health, Iowa City

MOST of the work of designing swimming pools has fallen to the local city engineer, the local architect, or to some other person who might be expected to be familiar with the general type of construction into which tanks fall. Frequently the person selected tries to get information about the design of pools from the engineering papers or from trade literature, and he finds some material there. Unfortunately, a goodly part of the material that he will find in the magazines available is not good material—at least it is not good material from the standpoint of operation and sanitation.

The data to be found in these papers concern chiefly the excavation, the reinforcement, the expansion joints, and the concrete shell. In other words, the articles are about the very parts of the work with which the engineer is most familiar, and on which the competent man is not so very likely to go wrong. But the swimming pool is something more than just a tank. It is not just a place to store a lot of water. It is a place designed for a very special use, whether it be an indoor natatorium or an outdoor one.

The purpose of this paper is to explain why the ordinary tank is not a satisfactory swimming pool, and to mention some of the features which should be taken into account in the design of this type of equipment.

Drainage and Dimensions

To begin with, we will admit that the basin should be tight, that it should be designed with the expectation that the temperature in indoor pools will range from a winter temperature to at least 85 degrees Fahrenheit, and that the walls should be designed so that the basin may stand full or empty with ample safety. The pool should drain completely and reasonably quickly, without the backing up of water in the sewers.

The minimum length of pool in which athletic records may be made is 60 feet;

therefore this is the minimum length, except under unusual conditions. Five-foot swimming lanes are required, and, therefore, it is a good idea to design the width of the pool so that it is in multiples of 5 feet.

The most satisfactory depth range is from about 3 to $7\frac{1}{2}$, 8 or 9 feet. Where young children in any number are to be among the patrons, the 3-foot depth may with reason be lowered to 6 inches, or even to zero. There is no necessity for a great area of deep water. To be sure, there should be deep water at the points where divers will enter the water, but there is no need for water over $4\frac{1}{2}$ to 5 feet deep for the rest of the swimming. Indeed, the greatest fault with most of the pools in use to-day is that they have too much deep water. This is particularly true of the large outdoor pools.

Deep water means increased water capacity. That means uneconomical design, for the water must be paid for, and in many cases it must also be heated. More important than this, deep water restricts the use of the pool. Most people who use a public pool are not able to swim well; at most, they paddle around a little. Many never take their feet off the bottom. If there is a large area of deep water, these people, who constitute the bulk of the patronage, are herded together in the shallow end of the pool, where they are subject to less sanitary conditions than if they had more space.

About 90 per cent of the area of a large public pool should be shallow area; that is, the water should be 5 feet deep or less. In a small pool, nearly the same area of deep water as in the larger ones is necessary for the divers. However, an area of deep water across one end of the pool and about 10 to 15 feet wide ought to be ample. Where spring-boards or towers are used, the deepest point should be below the place where divers from the tower or spring-board will enter the water.

College pools and others that are to be used for contests, meets, etc., may with reason have a larger proportion of deeper water, but since most of these pools also are used for swimming classes, the deep-water area should not be a great deal more extensive.

The deep end of the pool should be the end away from the entrance to the enclosure or pool room. The dressing-rooms and baths should be located at or near the entrance. This arrangement will tend to keep poorly qualified persons from getting in the way of divers, and will lessen the danger of accidents through such interference, and also through non-swimmers falling or being pushed into the deep water. The scheme of putting the deep-water area in the center of a large pool has much to recommend it. It may be assumed that only the strong swimmers will get out to the diving platform and tower in the center of the pool. Occasionally, some swimmer will reach the platform after a fatiguing effort and will be afraid to attempt the return trip, but, of course, life-guards should be on the raft or platform and would help the swimmer back to safety, if requested.

Importance of Scum Gutters

The second error of construction, in point of frequency, is the failure to provide scum gutters entirely surrounding the pool. Some of the companies that get out pool literature apparently overlook this essential feature, and advise merely surrounding the basin with a pipe life-rail. A life-rail of some sort is essential to the safety of the individual bather, but it is better to use a combined scum gutter and life-rail than a mere pipe. The common commercial types of scum gutters are cast so that the lip of the water channel fits the hand and provides an excellent handhold, while the channel itself forms an expectation and overflow trough, and a passage through which all surface wastes and dust may be carried away to the sewer.

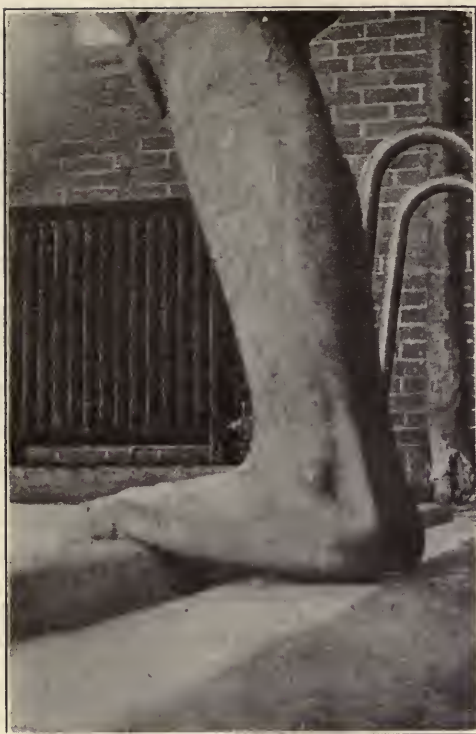
Dust and collections of floating matter in many cases may be flushed away merely by raising the water-level and letting the overflow carry it into the scum gutter and so on to the sewer. This floating matter is unsightly and difficult to remove when a gutter is not provided around the whole pool. I have seen outdoor pools where it was necessary to attempt to bail out the dust, dead frogs, grass that had blown into

the pool, and similar *débris*, by the use of a bucket. It was a time-consuming and imperfectly successful job. Yet in one of our foremost engineering journals the designer of that pool recently described the overflows as being ample and gave them the chief credit for keeping the pool in a satisfactory state, with only secondary mention of the chlorination boat—the thing that actually did the work. Much of the material discharged from the noses and throats of the patrons of the pool will float, and will collect at the point where the dust gathers. The sooner such material goes down the sewer, the better, for it is potentially very dangerous. Most pool operators try to see to it that the bathers spit into the scum gutter, where there is one. Others simply say, "Do not spit in the pool." But the man who is in the middle of the pool must spit somewhere when he takes aboard too much water, and he can't take the time to come clear over to the edge in such an emergency. When a scum gutter is provided, however, the bathers will use it as much as they can, and every bit of dangerous matter that can be kept out of the pool water should be kept out, by all means. Of course, the scum gutters should drain quickly and completely.

The Runway

The next thing to be spoken about is the runway. Many of these are entirely too narrow; many of them are made of material that becomes very slippery when wet or that is not easily kept clean. The greatest trouble comes from the way that the runways are pitched to drain. They ought, of course, to drain away from the pool sharply enough so that a bead will not need to be put on the pool edging. A serious error is made if the drainage from the runways is led to openings that carry it down into the scum gutter and subject it to the danger of being carried out into the pool. The runway drainage carries much dirt and a lot of very objectionable bacteria, and it also ought to reach the sewer as soon as possible.

Personally, I like to see a raised edge about a foot wide and about 6 or 8 inches high all around the pool. This definitely separates the runways from the pool, prevents drainage of all sorts from getting in, and allows scrubbing and flushing of the runways without any possibility of the wash water's being carried over the edge.



THE SWIMMER CANNOT GET A GOOD START IN A RACE WHEN THE EDGE OF THE POOL IS BEADED

On account of the possibility of tripping over the raised portion, it should be lined or marked so that this raised edge will be quickly noticed.

Beads on the edge of the pool make it hard for swimmers to get a suitable start in races, since the foot must be tilted so that the toes are raised. A square corner rounded at the edge, with a curve of short radius, is the best type of edge from the swimmer's standpoint.

Housing of Indoor Pools

The height of the room in which an indoor pool is placed is an important matter. The old type of dark basement pools is passing out of existence. They were neither attractive nor easily taken care of. Nowadays the greater number of pools are housed in large rooms with plenty of window space or with skylights to supply illumination during the day. The fact that the air of pool rooms is saturated with moisture calls for special water-proof finishes and the elimination of iron fixtures as far as possible. The iron fittings rust

and cause stains on any light-colored substance over which flows any water that has condensed on, or come into contact with, iron.

Ventilation by windows alone is unsatisfactory. During cold weather, the cold air from the outside blowing into the room causes clouds of condensed water to form. This is objectionable from its effect on the fixtures and on the comfort of the bathers. Cleaned air warmed in winter and provided by a series of ventilating ducts is preferable.

The height of the pool room should be at least great enough so that divers from the spring-board are not endangered. About 12 to 15 feet is needed between the top of the board and the ceiling.

Keep Spectators from the Runways

When spectators are allowed to move about on the runways where the swimmers are, there is bound to be more or less tracking of undesirable dirt into the enclosure, and the consequent carrying of the dirt into the pool on the wet feet of the bathers. Visitors' galleries, grand stands and simi-



METHOD OF SURMOUNTING THE DISADVANTAGE OF BEADING ON THE EDGE OF A POOL

lar places should be provided and definitely separated from the swimmers' enclosure.

Every one realizes, I suppose, that the lining of the pool should be of the smoothest, most impervious material that can be secured for the money available. The lining should also be as white as possible. A white, smooth surface is most easily kept clean, and by reason of its apparent cleanliness is most attractive.

Swimmers' Lanes and Other Lines

It is desirable to mark the walls and the bottom of the tank with dark lines adapted to the use to which the pool will be put. In tile-lined tanks, the dark lines may be of dark green or black tile. In general, the lines that are most desirable are swimmers'-lane lines. These lines should start well above the water's edge and be continued without break for the entire length of the tank and up to the corresponding height at the other end. Using these lines, the swimmer can keep within his lane, whether he keeps his head above the water or swims face downward with his eyes open under water. Additional lines for water basket-ball and water-polo, and the line on the tank showing the jack-knife limit, 6 feet from the end of the spring-board, are desirable.

It is desirable, also, when possible, to show the distance from one end of the pool to the other. This may be done by plac-

ing a small mark at every foot, with every fifth or every tenth foot numbered. These marks are useful in watching the plunge for distance, and are helpful at other times. Signs about the pool showing the depth at definite points are well worth while, as they may prevent persons from diving into shallow water, or from going in beyond their depth.

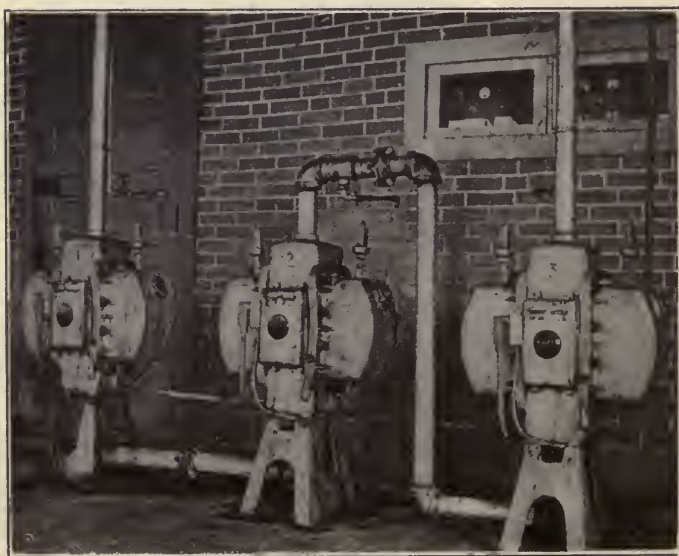
Filtration and Chlorination

If the tank is kept filled with clear, colorless water, the floor of a white-bottomed pool should be very easily seen. This is exceedingly advantageous. It enables the life-guards to keep a more efficient watch on the bathers and prevents the accidents which may result by a swimmer's sinking and the fact's not being noticed until too late. Of course, a thing like that is not very likely to happen when the pool is not crowded, but when the pool is crowded, the life-guards have their hands full to keep order and to watch the swimmers who are in plain view.

Continuous recirculation and refiltration are desirable for the purpose of keeping a pool water clear and in suitable condition from the standpoint of appearance, as well as in a sanitary state. Filtration alone is not regarded as ample protection, however. The heating and aeration that pool waters get causes a large part of the gases in the water to escape. Some of the

calcium bicarbonate breaks up, the normal carbonate precipitates, and then we have a whitish turbidity, due to the precipitate. This condition is one which is most usually found in the indoor pool where a hard water must be heated. The calcium carbonate has a bad way of cementing the sand grains of the filter and so rendering the filtration less satisfactory.

It can be shown that refiltration and recirculation of pool water are desirable from an economic consideration. They allow waters to be used for a much longer period of time and so save in the



ULTRA-VIOLET RAY APPARATUS, UNIVERSITY OF IOWA



"W & T" CHLORO-BOT STERILIZING THE POTOMAC TIDAL BASIN, WASHINGTON, D. C.

first cost of the water and in the heat necessary to bring the pool of water to a usable temperature; and besides this, they lower the turbidity, and keep it down, in spite of the tendency for the carbonate decomposition to make the water turbid after use. Filtration removes bacteria, but not to a sufficient degree as ordinarily practiced. It must be supplemented by some other means. This means the use of some germicidal agent.

The common germicidal agents are copper sulphate, chlorine (either as the liquified gas, or as the hypochlorite of calcium or sodium), the ultra-violet rays, or ozone. With the last named process I have had no experience. I am conducting some experiments on the ultra-violet rays at the present time. My experience with the use of chlorine has been successful, although the chemical has to be handled with discretion, and persons are apt to claim that they can detect the odor of the chemical when it has not yet been used. Personally, I prefer the liquefied

chlorine as being susceptible of more accurate and more workmanlike control. It is more expensive to install and operate apparatus for gas under pressure, but the gas does not deteriorate on storage as the hypochlorite does, and the apparatus, which must be handled with care, will stand up well if given a chance. Copper sulphate has some germicidal powers, but is most useful in keeping down the growths of algae or water scums which frequently bother the operators of open-air installations.

It is important to remember that while well-recognized methods of treatment help greatly in maintaining clean swimming-pool water, they do not in themselves insure a safe condition. The equipment must be properly and continuously operated and the supervision of the pool and bathers must be constant and careful.



Water for the Community Swimming Pool, Aurora, Ill., is passed through the Graver recirculating and refiltering system, where it is filtered and sterilized to remove suspended matter and bacteria. This system has two vertical pressure filters each 12 feet in diameter by 10 feet high, using a filtering medium consisting of two layers of crushed quartz above two layers of graduated sized gravel. These filters have a capacity of 29,260 gallons per hour, based on a rate of 3 gallons per square foot of filtering surface per minute; one alum pot for introducing alum into the water; one Wallace and Tiernan chlorinator; and one centrifugal American Well Works pump, having a capacity of 28,500 gallons per hour

Removing Deposits from the Tank Bottom

A certain amount of dirt, lint, hair, etc., will settle to the bottom of the tank after a time. Although this material is very offensive in appearance, and looks very black, it is only a very thin layer of fine, powdery deposit. It is not readily drawn toward the outlet during recirculation, and when an attempt is made to sweep it toward the outlet by means of weighted brooms, it rises into the water and dissipates, only to fall down again when the currents have subsided. Then it looks just as bad as ever.

This dirty deposit may be removed with a sort of vacuum cleaner arrangement especially designed for such work. The water which is removed by the tool from near the bottom of the pool may be deposited either upon the top of the filter and the deposit strained out, or run into the scum gutter and the water and dust run together to the sewer. Whenever a new pool is constructed, some arrangement should be made to take care of these dirty-looking sediments. In an indoor pool with white tile lining, the dirt is very likely to make swimming in the pool unattractive, and its removal is quite a bit more important than in the outdoor pool, where it is not so noticeable.

Water Dilution and Pool Safety

From the standpoint of sanitation, the material in the pool which is most likely to cause disease consists of the fresh secretions newly thrown off from the bodies of bathers. Some of the organisms that we fear the most are very delicate and highly specialized. They do not adapt themselves well to unfavorable conditions. Lower temperature and less abundant food than they find in the body constitute such unfavorable conditions. Among these fragile organisms are most of those that cause infections of the respiratory tract. The organisms that cause intestinal diseases, such as typhoid, are more resistant—though they, too, soon succumb in the fight for life against stronger organisms which they encounter in the pool. The common soil and water bacteria find conditions much more to their liking and they are stronger than the pathogenic forms.

As a result of this, the man who is in the pool with you is a more real danger to you than the man who was in the pool yesterday. To make the pool safe, there

should be a rapid dilution of infective material and a correspondingly rapid carrying away of the dangerous substances toward the exit pipes. Any type of inlet and outlet that will accomplish this rapid dilution and allow the minimum dead water areas will be satisfactory.

But a word of caution is needed in regard to pool safety. Do all you can to make the pool safe; keep everything as clean as you can; still you are very likely to hear of ear and eye trouble among the users of the pool. A good deal of this is auto-infection. The bathers are carrying the causative organisms on their own body surfaces, and when the maceration of the skin has reduced its resistance to the invading bacteria, they may enter and cause trouble. Rigid inspection of bathers is helpful, but it will not entirely remove this condition.

The maximum safety from dangers incident to unsanitary conditions must be given, but attractiveness, comfort and convenience are important, also. Hence, consideration should be given to toilets, locker-rooms, dressing cabinets and showers. They, and the arrangements for handling the towels and suits, need careful planning.

Toilets and Shower-Baths

In order to avoid any possibility of the swimmers' voiding body wastes into the pool, adequate toilets should be provided and kept in such perfect sanitary shape that they will not leave in the mind of the patron the idea that they are likely to spread disease. The toilets should be in a place reached easily either from the pool or from the shower-room. Indeed, the idea should be to make it easier for the patron to remember to use the toilet before going into the pool than for him to forget to do so. Signs in the shower-room or in the individual dressing and shower-booths should remind the persons taking showers, or getting ready to do so, that the taking of an adequate shower-bath and the use of the toilet is expected in the interest of the sanitation of the pool.

Shower-baths, preferably with warm water, should be taken by all persons before going into the tank. Soap should be used. When possible, the bathing should be supervised by an attendant, who would also be able to make a superficial physical examination, excluding any one suffering

from infections of the skin, colds and sore throat, and preventing anyone with an open wound from going into the water and endangering himself. It is easy to see that, if care is not taken to keep dirt and dangerous bacteria out of the pool, it will soon be necessary to let the entire poolful of water run down the sewer. It is economy to provide ample showers, and ample water at an agreeable temperature. Special devices intended to cause all patrons to walk through a shallow foot-bath of water and to pass under a shower have been devised and recommended. I have not had special experience with these, but I am convinced that adequate showers and actual inspection of bathers are most desirable.

Swimming Suits and Towels

Towels and swimming suits are sure to pick up matters of a most undesirable nature. If the towels and suits are to be supplied by the pool management, they must be adequately cleaned and actually sterilized after each use. To fail to do this is to invite trouble. Skin diseases are very likely to be spread by suits and towels. Clean towels and suits should very care-

fully be kept from contact with soiled ones. They may even cause trouble if carelessly handled. In one epidemic of skin disease with which I am personally familiar, cleaned and sterilized towels were contaminated at the towel room of the pool. On checking up, it was found that the towels were brought back in the baskets in which they went to the laundry, and were piled in places occupied during part of the time by soiled towels and suits. They also came into contact with the soiled towels. More careful handling of the towels resulted in the disappearance of the trouble. A careless towel-room attendant may do a lot of mischief.

And Don't Forget Adequate Parking Space

Provision of adequate parking space for automobiles is an important matter nowadays. Too small a space necessitates undue crowding, with danger to cars in getting them out in leaving, and this makes many people reluctant to go to the pool. A safe and sufficient parking accommodation would have resulted in increased attendance at several pools last summer.

A Milk Lunch at School

THE accompanying picture shows a noon hour scene in the public schools of Sioux City, Iowa, where Superintendent of Schools M. G. Clark has introduced a milk lunch dieting program. Noting the undernourished appearance of many young pupils, and the unsuitable food brought from home in

their lunch boxes, Superintendent Clark induced the Board of Education to provide milk as a part of the children's daily luncheon. Incidentally, at noon hour, the children are taught table manners and the etiquette of the dining-room, and the parents are enthusiastic over the new idea.



THE NOONDAY LUNCH IN A PUBLIC SCHOOL IN SIOUX CITY, IOWA

Parking---When, Where and Why?

By Miller McClintock

Sheldon Fellow, Harvard University

Limited Parking

IN an attempt to solve the problem of street congestion in their business districts, practically all cities have now placed limits on the length of time which vehicles may be permitted to stand at the curbing. These limits range from ten minutes to six hours. The tendency has been to shorten the time with the increase of the problem.

Theoretically, these provisions do away with the "street hog" and make it possible for the drivers of vehicles to use the street in rotation. In actual practice, however, they have but little effect, for they cannot be enforced. It is estimated in most cities that if the entire police force had no other duty than the enforcement of parking restrictions, they would not be able to accomplish the task well. Evasion is made easy by the fact that owners can move their cars a short distance and thus gain the use of the street for another interval. Even though the fifteen-minute and half-hour limits could be enforced, it is to be doubted if relief would result. The constant moving in and out of spaces at the curb would cause disturbance to moving traffic, and in busy districts the available spaces would still be filled with standing vehicles.

Prohibited Parking

The difficulty of enforcing limited parking, together with the growing density of traffic which has seriously hampered the carrying on of essential transportation services in the congested districts, has led cities to contemplate a complete prohibition of parking. Boston, Buffalo, Chicago, Cleveland, Washington, Kansas City, New Orleans, Philadelphia, Seattle, and Portland (Ore.), have already prohibited parking in certain limited localities. These and other cities have contemplated an extension of the prohibition to the entire business district. Where the proposals have been made, they have always met with strenuous opposition. In Los Angeles, and in Washington, D. C., where an extensive

prohibition was put into effect, the merchants were successful in bringing about an abolition of the rule within a few days.

The principle involved in prohibited parking is simple, and is one which cities will be forced to accept in the near future. The streets were dedicated for the purpose of travel and for acts incident thereto. Thus travel and the loading and unloading of goods and passengers are proper acts in the street. The storage of cars on the street, however, is an act not immediately connected with the purpose for which the streets were created. The fact that such a use of the street has been permitted in the past is no reason why it should be continued. Double parking by commercial and other vehicles which are forced to stop in the center of the street to discharge their loads, often completely blocks the thoroughfare. Double parking is an indication of supersaturation, and is the most threatening aspect of the present-day traffic problem. It means that the cars at the curb which are using the street for storage purposes are strangling essential transportation activities upon which the city must depend for its existence. The principle which should guide cities is this: when the use of the street for storage purposes impairs the use of the street for purposes of transportation or for acts directly connected with transportation, the former use must be prohibited.

The actual effect of prohibited parking on business has never been determined, for a fair experiment has never been made. Shops which cater to the poorer classes in the community will not be affected, for their patrons do not usually shop from motor cars. The exclusive shops will be little affected, for their patrons come chiefly in chauffeur-driven cars which need not park, but can continue on out of the restricted district and return later for their passengers. The extent to which middle-class shops will suffer depends on a number of elements: the availability of paid storage spaces in close proximity; the number of their patrons who come in mo-

tors; and, finally, the adequacy and convenience of other forms of transportation, such as trolleys, subways, and motor busses. That prohibited parking will keep some small per cent of the population from the accustomed markets in the center of the city is probable. This patronage, however, will not be lost to the city, but will be absorbed by the local neighborhood stores, thus bringing about a decentralization of interests, which is greatly to be desired.

Prohibited parking will bring about an automatic elimination of many of the low-utility passenger cars which now crowd the streets. Many owners who now use their cars simply for the purpose of transporting themselves to and from their work, will be inclined to use rail or bus transportation rather than leave their cars outside of the prohibited area or pay storage upon them within the district. It seems scarcely fair that cities should continue to provide space with a property value often as high as \$25,000 for the storage of cars which are not of sufficient utility to owners to warrant their paying from 25 to 50 cents for their housing.

Public and Private Storage Facilities

Can adequate storage spaces be provided for those drivers who are willing to pay for the storage of their cars? It must be answered that at present no city has such facilities. In Boston, for example, it is estimated that 10,000 cars would be turned off the street by a parking prohibition, while public and private garage facilities have a capacity of only a fraction of that number. For this reason a gradual prohibition should be undertaken, beginning with the most seriously congested localities and slowly extending to the entire congested district.

The experience of a number of cities shows that public and private storage facilities will be constructed where the demand is sufficiently great. In Cleveland, a publicly owned plot of land in the center of the city has been converted into a parking square. A nominal charge is made, the square is constantly filled with

parked cars, and the city obtains a substantial revenue. In Chicago, a portion of Grant Park between Michigan Avenue and the lake front is used for a similar purpose. The space accommodates approximately 3,000 cars, and a fee of 25 cents is charged. Other cities could profitably use their vacant lands in the business district in a similar manner. In New York, Boston, San Francisco, and Los Angeles it has been proposed that excavations be made beneath city parks and that such space be used for storage. The cost of the undertaking has kept the suggestion from becoming popular.

Private facilities offer the greatest relief. In Los Angeles there are several hundred privately-owned parking lots in the congested district. These house thousands of cars at a fee of from 25 to 50 cents per day. In many cities there are vacant pieces of land in the interior of the blocks and behind the present buildings. If parking were prohibited on the streets, it is believed that the demand would be such that the owners of these plots would find it profitable to use them for storage spaces.

The automobile hotel, or down-town garage, is another source of relief. In Boston, Los Angeles, and San Francisco, for example, there are a number of such structures, and it is understood that they have been uniformly profitable at moderate fees. With proper building laws, there is no reason why such a structure should either add to the fire hazard of the business district or detract from its appearance.

With the growth of street congestion and the progress of prohibited parking, the provision of private storage spaces as integral parts of office and mercantile buildings is to be anticipated. There are already several examples of this in the United States. In Los Angeles, the newly constructed University Club building in the center of the city provides a built-in garage capable of storing the automobiles of the members. In the same city, the Pacific Mutual Life Insurance building has a two-story basement especially designed to store the cars of its officials and employees.

The Traffic Problem Is Largely One of "Floor Space"

That city which first provides floor space sufficient for all kinds of traffic will be ahead of any other city which hopes to compete with it in progress.—EDWARD S. JORDAN.

A Museum for Every Town

Assistance Available in Organizing and Financing New Museums and in Improving Small Existing Museums

By Louis Resnick

THERE is in every city and town a Tut-Ankh-Amen's tomb of relics and wonders which ought to be broken into and appropriately displayed for the benefit of present and future residents and visitors. Untold treasures of historical, scientific, and artistic value lie hidden away wherever people live and have lived. These treasures should be brought to light and made easily available to all for their educational and cultural value.

The search for these objects in one's home town may not afford as spectacular an adventure as the Luxor excavations into the mausoleum of the Pharaohs; but in the long run it will prove even more interesting locally, because Egypt is thousands of miles away and most of us can never get there, while everyone could go to a museum in his own town, and the things he would see there would usually concern him much more intimately than the objects in an ancient and almost forgotten monarch's resting place.

This, in a nutshell, is the philosophy of Laurence Vail Coleman, Secretary of the American Association of Museums, whose headquarters are at the Smithsonian Institution in Washington, D. C. It is, however, no static philosophy. For, as Secretary of the Association and as Editor of *Museum Work*, the magazine of museum executives and professional museum workers, he has been busy for several years helping communities already having museums to make their exhibits of greater service and smoothing the way for those interested in developing a city's first museum.

It is the purpose of the American Association of Museums to assist in the organization of a museum in each community where there is sufficient interest in the subject. The movement offers a double opportunity for distinction—an opportunity to each city to create something of permanent value and interest for itself and thus attain a higher civic plane; and an opportunity for public-spirited citizens and enterprising city officials to gain local

distinction by becoming the founders of an institution that will live long after them.

Nothing is more likely to inspire the citizens of a community with civic pride than a museum in which are recorded, by material exhibits, the history of the place, its natural resources, its arts, the processes and products of its industries, and, in addition, in which are exhibited interesting things which have been brought to the community from far corners of the world. One of the things which lend so much charm to European cities—the small ones as well as the capitals—and attract to them so many visitors, including the hosts of Americans who travel to them, is that they generally have museums steeped with things about which for ages back the traditions of the town have been woven. Nearly every town on the other side of the Atlantic possesses a museum in which are displayed objects through which its history may be traced, in which its artistic creations may be viewed, and where the products for which it is most famous, and the processes in their manufacture, may be studied.

American communities are now sufficiently grown up to do likewise. The establishment of such museums in American towns would make them more interesting places in which to live, and would give more justification to the slogan, "See America First."

The American Association of Museums has issued an invitation to individuals and organizations throughout the country that are interested in establishing museums in their respective communities, to organize local committees for this purpose and then to communicate with the Association. The Association will furnish assistance and guidance in organizing and financing the enterprise and will acquaint the committee with the methods which have proved most successful in other cities. In particular, the Association seeks to obtain the interest of school officers, historical and art societies, scientific and technical bodies,



THE LIBBY MUSEUM AT WOLFEBORO, N. H.

business leaders and municipal officials. Directors of small existing museums are also urged to avail themselves of the Association's facilities.

The Association has prepared outlines

of the scope of typical small museums which should prove of inestimable value to those interested in the movement. Large cities, of course, have facilities and sufficient funds for the maintenance of separ-



INTERIOR OF THE LIBBY MUSEUM

ate museums of art, science, history, and industry. For the smaller city where there is at present no museum of any sort, Mr. Coleman recommends the building up of one general museum giving attention to all these subjects. He suggests, for instance, the collection of accurate information about authenticated historical objects, such as old costumes, house furnishings, implements, weapons and manuscripts, which trace the community's founding and growth; natural history objects, including local animals, plants, and minerals; works of American art, with special attention to work produced in the community, together with small collections of art objects of other times and places; and exhibits showing the materials, processes, and products of local industries and commercial organizations, these last serving to give citizens a better understanding and

appreciation of the importance of their community in the realm of business.

The community which is wise and courageous will, in planning the establishment of its first museum or the rehabilitation of an old museum, do well to plan on the principle laid down by the late Daniel H. Burnham, architect and city planner, when he said:

"Make no little plans. They have no magic to stir men's blood, and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever growing insistency. Remember that our sons and grandsons are going to do things that would stagger us. Let your watchword be order and your beacon beauty."

"Labeling" Buildings and Other Fire Prevention Suggestions

IN a recent letter to THE AMERICAN CITY, F. W. Fitzpatrick, consulting architect, of Chicago, offers several suggestions for activities to reduce the fire waste in American cities. To quote in part:

"The whole fire situation could be absolutely controlled by the insurance people. They have given a hand to fire prevention, and now have experts, engineers, bureaus, all at work bettering conditions. I would ask them to take another step—a more drastic inspection of buildings, particularly the public and semi-public ones, theaters, hotels, offices, factories and such. A fire-door found blocked open, old hose dried out and useless, rusted stand-pipes, sprinklers and such equipment should subject a building to increased rates—a species of fine; a second offense or failure to do as notified, cancellation of insurance—and you have much of our fire loss right in hand. Costs something, yes, but worth it. A bit heavier premium to pay for inspection, but after a time all premiums could be lowered. Even repairs could be done by the insurance companies—repairs or replacement needed in fire equipment—and charged to the owners of buildings. All the companies are, together, virtually one affair, and the underwriters, as a body, have autocratic power by reason of their rates and schedules. If they really want to reduce fire losses, let them prove it by initiation of this system.

"It may take time to secure requisite legisla-

tion or authority, for the owners of cheap buildings will object, but the cities—urged by insurance—can do something else we have clamored for for years, something most effective—the 'labeling' of buildings. Classify them and label conspicuously at their main entrances. 'Fire Resisting,' 'Ordinary,' 'Dangerous.' Note the alacrity with which the man with 'Dangerous' over his door will revamp and better his building so as to meet a higher classification; or he will tear it down altogether and build decently.

"Then we can urge legislation that will amend our system of taxation. Now, the more a man spends on his building, the better he builds it, the safer it is, requiring the minimum of city protection, fire departments, water pressure, and all that, why, the greater his taxes! Change all that so the fellow with the old, inflammable tinder-box of a building—requiring the maximum of city protection and constituting the greatest danger to all surrounding property—will pay the higher rate of taxation.

"It is passing strange, but interesting withal, that in all reforms, the masses have to be compelled, to do certain things by authority and the authorities have in turn to be compelled to apply these compulsory measures by the weight of public opinion; public opinion in turn is molded, created by printers' ink; and I know of no cause that deserves better at the hands of the press than does this one of fire prevention."

How Should Water Taste?

A Plea for More Palatable Water

By John R. Baylis

Principal Sanitary Chemist, Baltimore Water Department

WE know that water, as ordinarily found, is not pure, but contains small amounts of chemical substances in solution and suspension. While the salts occurring in the average water are small in amount, they may impart tastes and odors to it, some of which make it more palatable, while others make it less palatable. In a few localities there are springs and wells where the water possesses a taste pleasing to all. Such waters are not frequently found and constitute a very small per cent of the ground waters of our country. Very few public supplies are satisfactory in taste to all consumers.

In many cities the amount expended for spring or bottled water is enormous. There are no large cities where bottled water is not sold if it is available at a reasonable cost.

This, of course, applies to places where it is purchased because it is more palatable than the public supply, and not where it is supposed to have medicinal qualities. Part of this may be attributed to a mistaken idea that spring water is naturally better than any other, but in most instances the reason is its palatableness.

The taste we ordinarily find in water is the combination of a variety of tastes produced by the various compounds in solution. Some people are more sensitive to certain tastes than to others. Compounds that might impart a very noticeable taste to one person might not be detected by another. It is believed that herein lies the reason for such varied opinions as to the palatableness of many waters. By continued use, certain tastes become so familiar they are not noticeable. Such tastes are

not very objectionable and possibly would not justify a great expenditure for correction. There are, however, objectionable tastes in many of the waters of our country that will always remain objectionable, unless removed. It is the removal or prevention of these that should receive more consideration from our water-works officials than heretofore. Changes in our modes of living, and the vast amount expended for things that add comfort and pleasure to our lives, justify the assumption that we are now ready for more rapid progress in improving the palatableness of our drinking water.

Nothing is taken into the human system more often and in greater quantities than water. It constitutes a large percentage of our foods and beverages. While most of the water necessary for life may be obtained in this manner in the cooler months, most of us consume a considerable amount in addition to this in the summer months. Many health authorities now advise an increase in the amount of water consumed, as an aid to health. If this is a fact, anything that adds to the palatableness of our drinking water aids health by increasing the amount consumed.

Progress in Water Purification

The great progress being made in water purification gives us hope that we will have better-tasting water in the future. Hardly a city or a community is now supplied with water dangerous to health. Nearly all the muddy surface supplies are filtered,

and practically all polluted supplies are treated with chlorine or rendered safe by some method, such as storage or filtration. Some cities resort to storage, filtration and chlorinization. We no longer take a drink of water with the fear that it will contain the deadly typhoid germ. So great has been the desire to produce water that is safe from a sanitary standpoint, that its palatableness has been sacrificed in many instances. This is the proper thing to do, should one or the other have to be sacrificed, but water may be made safe without so doing. In some instances, chemical treatment and filtration have not improved the taste; in fact, in a few instances it seems to have made the water worse. This

is due to improper treatment and may be easily avoided. Rapid sand filtration is an art developed greatly in advance of the science. Progress is being made, however, in the chemistry and biology of water treatment, and we may expect great improvement in the future. The health authorities have been satisfied as to the sanitary qualities, now we must satisfy the consumer as to palatableness.

Not long since, the superintendent of a filter plant made the remark that the water was all right when it left the filter plant and it was not his fault if it got bad before it reached the consumer. It is hoped that this feeling is not shared by many filter operators. A cure for such feelings would be to construct dead-end mains, so that the water for the filter operators will stand in the main at least a week before being used. One instance is recalled which resulted in the use of spring water by the operator. The filter operator should be interested in the water that reaches the consumer and not necessarily in that which leaves the plant. Corrosive water may leave the filter plant very palatable, but reach the consumer quite different. What the consumer wants is water that is pure bacterially, palatable and clear. The great progress in water purification has been confined largely to the purity and the clarity. No universal program has been started to improve the palatableness of our waters. Here and there we find an attempt to improve a very bad-tasting supply, but very little has been done. Water-works officials usually make the excuse that the objectionable tastes are naturally in the water and there is no way of removing them. The tastes are not naturally in the water when it is in the clouds. There is hardly anything as tasteless as pure rain or distilled water. The problem of the future is to see that the pure rain-water reaches the consumer with the substances producing desirable tastes added and those producing objectionable tastes left out.

Improving the Palatableness of the Baltimore Supply

The palatableness of Baltimore's water is not all that is desired, but we can say there has been an improvement. This has been brought about by increasing the storage and by improving the efficiency of the purification plant. The construction of a

larger reservoir required the partial purchase of two small villages that constituted the closest source of pollution. The time of storage has been increased from a few weeks to several months, resulting in a marked decrease in the number of bacteria present. A sanitary inspector on the watershed has also done much towards the abatement of pollution. Most of the disagreeable tastes in our water since the use of chlorine can be attributed to chlorine, consequently the elimination of pollution and increasing the time of storage has greatly helped to insure a safe water without using an excessive amount of chlorine. Next to chlorine tastes have been those caused by corrosion of the service pipes. Properly treating the water has reduced corrosion to a minimum, so there are practically no tastes from this source. Before the days of chlorine, this was probably the greatest cause of disagreeable tastes, not only in Baltimore, but in most cities having soft water. It seems strange that very little effort has been made to prevent corrosion, when it may be done so easily. The savings in repairs to pipes would justify the expenditure in most instances. Baltimore's water may be too soft to make it the equal of the most palatable spring waters, but it is possible to improve it to where it will approach them. There is one problem, the solution of which is practical, and when done will make our water excelled by none: it is the control of micro-organisms in the reservoirs. It is believed the results will fully justify the expenditure. In the last two years, micro-organisms have been directly responsible for the annual use of over \$15,000 worth of chemicals more than should have been required; consequently, the expense of controlling their growth may be largely offset.

Causes of Objectionable Tastes

The causes of objectionable taste in water are quite variable. It may be from some chemical, such as iron, chlorine, or an alkali; from some organic compound, such as decaying vegetation; from microscopical organisms, corrosion, pollution by trade wastes, chemicals used in treatment, or other sources. Most of these causes may be removed at a reasonable expense.

Salts in solution, such as the chlorides and the so-called alkali waters, present a very difficult problem. The best solution in

many such cases is probably another supply. The sodium compounds are so soluble that their removal from water on a large scale is very expensive. In the alkali regions, chemistry and not engineering should be given preference in the selection of a supply. Fortunately, there are not a great many supplies affected by sodium compounds to an objectionable extent. It may be best in some localities to depend entirely on rain-water for cooking, drinking and a few other uses. A few salts added to make it non-corrosive will produce a very palatable water. The cost is well within the bounds of possibility. It is estimated that the amount expended for water is not over 1 per cent of the average living cost—possibly not as much for each individual as most men spend for their collars and neckties. If food is over 30 per cent of the living cost, and water is taken into the human system in even greater quantities, we readily see why a tremendous increase in the cost of water would not be imposing an undue burden. If the uses of a certain water were confined to drinking and cooking purposes, 10 gallons per capita per day would be a liberal allowance. At this rate, 12 inches of rainfall annually would produce enough water per acre for approximately 100 people, if it all could be collected and saved. A reliance on rain-water is practical in most localities, and at a cost well within the bounds of what might be expended for drinking water.

Iron.—The methods of removing iron from water are so well known that it is not necessary to discuss them in this paper. It may be reduced to where it is not objectionable at a very reasonable cost. Where water is filtered, iron is usually removed without making any extra provisions.

Organic Compounds.—Very little is known of the organic compounds existing in water. The fact that they have not occurred to an objectionable extent in many supplies is partly responsible for the present lack of knowledge on the subject. The vast number of organic compounds, many of which might exist in water, and the difficult methods of determination as compared with the inorganic tests usually conducted on water, have tended to prevent any one from tackling the problem. Water purification has not offered a very attractive field for the organic chemist. Many of us have realized only recently that or-

ganic chemistry played a great part in water purification. We are now trying to solve such problems by the hit-or-miss plan. If we do a certain thing and it improves the quality of the water, all is well; but if the organic compounds change the next day and results are not so good, we wonder why. This state of affairs is not going to exist much longer, for we are going to brush the dust off our books on organic chemistry and get busy.

Micro-Organisms.—What has been said about the lack of knowledge of organic chemistry as applied to water purification applies almost equally to micro-organisms; in fact, micro-organisms and the organic compounds are so intimately related that one can hardly be considered without the other. It is likely that organic life produces most of the changes in the organic compounds of water. Where water is stored, they may become of great importance. The fact that over five million living organisms averaging 0.01 mm. in diameter may exist in an ordinary drinking-glass full of water without being detected, shows what a vast biological factory for the changing and producing of organic compounds might exist unaware to any one except the biologist. So long as this biological factory confines its work to the production of inoffensive compounds, it is not of serious consideration, but when it produces offensive odors, disagreeable tastes, and possibly poisonous compounds, it becomes of great importance.

Copper sulfate and chlorine, if properly used, are very effective weapons in keeping organic life under control in reservoirs. It is desirable in most instances to kill the vegetable life at its point or origin rather than to attempt to kill the higher forms of animal life later on in the reservoirs. Part of the organic compounds in water may be organized by the vegetable organisms from the carbon dioxide and other substances in the water. To kill organic life does not necessarily remove the organic compounds, but may leave the compounds in the water to be used later by other micro-organisms. We thus see the value of preventing the first growths of organic life in reservoirs. The lower forms of vegetable life are also very easily killed by copper sulfate and chlorine, whereas the higher forms of animal life are not. Considerable work has been done on the control of microscopical

growths in reservoirs by a few water-works with varying degrees of success, but such work has not received the consideration deserved. Many water-supplies are badly in need of systematic control of the microscopical growths in their reservoirs. More effective methods may be discovered in the future, but there is now no reason why offensive odors and tastes caused from such sources should be tolerated.

Corrosion.—Tastes produced by corrosion of the service pipes are confined largely to the softer water. Occasionally a fairly hard water will corrode iron pipe, but it is an exception and not the general rule. Heretofore we have been at a loss to understand why some waters were more corrosive than others, with very little difference in the chemical compounds in solution. The hydrogen-ion concentration now explains the reason. Two waters may have the same alkalinity and one be very corrosive while the other is not. The concentration of certain salts in solution has some effect, but there is almost a direct ratio between corrosion and the hydrogen-ion concentration of the water when the pH is below about 8.0, notwithstanding the fact that several authors have recently tried to show that the hydrogen-ion concentration within the limits ordinarily found in water has no effect. Protective coatings will form if calcium carbonate is present and the pH is above about 8.0, consequently there is practically no corrosion in many of our supplies. Fairly hard waters may form the protective coating when the pH is slightly below 8.0.

The author spent a few hours recently in a city of over 30,000 inhabitants and was impressed by the number of citizens complaining about the water. A visit to the filtration plant revealed a soft water with a pH of about 6.9 being treated with alum and a slight amount of lime. This produced a pH of approximately 5.0. There were indications that the pH varied from about 4.6 to 6.0 all the time in the filtered water. Repairs to service pipes will eventually cost the consumers more than would be necessary to make this water non-corrosive. The advantage of having satisfied customers would be well worth the expense even if there was no saving in pipes. If this condition is found in many cities, it is time someone is "waking up."

Other Causes.—Chlorine is the cause of

disagreeable tastes in many cities. The remedy is to improve the quality of the water to the point where an excess is not needed. Trade wastes and chlorine combined produce unpleasant tastes in some supplies. Such wastes as may affect a public water-supply should not be allowed to enter it. With the exception of chlorine, tastes produced directly by chemicals used in treatment are rare. It is possible to treat practically any kind of water with a coagulant and add no disagreeable tastes, nor increase those already present. In most instances coagulation and clarification reduce the tastes. Occasionally, softening plants may apply an overdose of lime and produce a caustic lime taste, but such conditions are due to errors and are not continual.

How to Have Palatable Water

If water was a competitive commodity like some of our foods, there would be more progress in improving the taste within five years than there will be in thirty under our present procrastinating method of doing things. The water-works are necessarily monopolies, but they are to serve the people. If the people are willing to pay the price, they should have what they want. Very few consumers will make complaints even though conditions are almost intolerable. It is not only the privilege but the duty of every one to make complaints when conditions are not satisfactory. A tremendous overdose of chlorine in the Baltimore water one day last year produced a very disagreeable taste, yet resulted in complaints from considerably less than 1/50 of 1 per cent of the consumers. Such conditions may give the management a false conception of the wishes of the consumers. When the water is not satisfactory, make complaints. Do not depend on your neighbor; he may be depending on you. "Kick" so hard that it will make the political foundation of the city hall tremble, and cause great uneasiness as to the safety of the structure. Practically all our foods undergo some preparation to make them more palatable, yet it seems that we expect nature to supply us with an abundance of water pleasing to the taste without any effort on our part to make it more palatable. If you want pure, palatable water, demand it. It can be supplied to you at very reasonable cost.

ACKNOWLEDGMENT.—From a paper read before the annual convention of the American Society for Municipal Improvements, at Atlanta, Ga.

A Child Hygiene Exhibit That Worked



THE "STREET" WITH THE FLAPS DOWN



THE "STREET" WITH THE FLAPS UP

THE accompanying views show an exhibit prepared by the Bureau of Child Hygiene of the Department of Health of Newark, N. J., as a feature of a public health exhibition recently held in that city.

The distinctive feature of the exhibit is the representation of a street in the city of Newark in which, by means of flaps which can be opened showing the interior of the rooms, each type of work carried on by the Bureau is il-

lustrated, such as:

Expectant Mother	Boarding Home
New-Born Baby	Colored Infant
Prevention of Blindness	Pre-School
Unmarried Mother	

It was found that this method of visualizing the activities of the Bureau of Child Hygiene aroused considerable interest and gave an opportunity to explain in detail the character of the work.



GENERAL VIEW OF THE NEWARK CHILD HYGIENE EXHIBIT

A Fire Prevention Campaign with an Exhibit Like This:



May Help to Prevent a Disaster Like This:



A System of Catch-Basins for Richmond, Indiana

By D. B. Davis

City Engineer, Richmond, Ind.

IN the districts of Richmond, Ind., where the street pavements are constructed of gravel or macadam and where storm water is permitted to enter a combined sewer lateral, it is deemed advisable to construct catch-basins in connection with the street inlets. A year ago a system of catch-basins which employs a removable metal lining was brought to our attention. The system seemed so practical and simple, both in construction and in cleaning, that this city determined to try it out.

The construction of the catch-basin involves the excavation of a hole 3 feet in diameter and from 7 to 8 feet deep; the depth being dependent on various conditions, such as gas and water pipes. The earth bank acts as the outer form for the concrete lining. The bottom and the walls of the catch-basin are of 1:6 concrete laid 6 inches thick.

After the completion of the excavation, the concrete for the bottom is placed in the hole and made smooth. Then the collapsible steel forms are assembled on the street and lowered onto it. The forms are made of 10-gage steel in two complete circular parts. Each part is 4 feet in length and comprises two or more segments of a circle. Between each two segments is a 2-inch metal strip on which are latches which fasten onto the abutting sheets and hold the segments together. Each sheet is reinforced at the top, bottom and center by a 1½-inch angle-iron, which is secured to the inner perimeter of the form. The two forms are set one on top of the other in the excavation and plumbed before pouring begins.



STREET SCENE AND SECTION SHOWING STREET INLET, CATCH-BASIN AND SEWER MANHOLE AS CONSTRUCTED IN RICHMOND, IND.

Concrete is then mixed to a wet consistency in a small batch mixer and placed in small quantities around the form, care being exercised to spade it well to secure a smooth wall. It requires about 1½ cubic yards of gravel and 6 sacks of cement to complete a basin. The inlet pipe and the outlet trap are placed against the form in their proper elevation and concreted into the wall. While the concrete is still soft, the iron ring which supports the cover is imbedded to the proper grade of the street surface.

The next day, when the concrete is set, the steel forms are removed. The latches on the removable side strips are turned in a vertical position, when the strips immediately come loose and fall forward. The larger segments are then loosened by slightly hammering against them, when they are jerked out by means of a rod with a hooked end which fits into holes in the angle-iron stiffeners.

The average cost to us of the complete basin is as follows:

1½ cubic yards of gravel at 1.35.....	\$ 2.02
1½ bbls. cement at \$2.80.....	4.20
20 hours' labor at 45 cents.....	9.00
2 12-inch elbows for water seal.....	5.00
Removable metal lining	30.00
	50.22
Ring and cover 250 lbs. at 4c.....	10.00
Total	\$60.22

This system of catch-basins is a flexible one, as they can be constructed either in conjunction with a street inlet or separately, and can be connected with one or more inlets by means of pipes.

The metal removable lining is made of Armco 10-gage metal, with a hinged bottom which opens downward, allowing the street detritus to drop freely from the bucket. The metal lining is made to a true circle, 23½ inches in diameter at the top and tapering to 21 inches in diameter at the bottom, and 36 inches in length. The purpose of the tapering sides is to prevent binding when being pulled. Holes ¾-inch in diameter and 8 inches on center are provided in the shell at the half and upper

quarter point of the lining, which liberate any water remaining in the upper part of the lining.

For cleaning it requires the work of one man, who also drives the truck or tractor as the case may be. In actual practice it requires about ten minutes to complete the hoisting of the metal lining from the concrete basin and dump its contents into the truck. The hoist used is an ordinary one in use by automobile repair outfits and can be attached to a wagon, a truck or a trailer. This city uses a Fordson tractor and a Miami trailer for cleaning the basins. We can clean from 40 to 50 basins a day. This is a considerable saving over cleaning by hand, which requires two or three men to clean from five to six basins a day.

The features which deserve consideration are that the basins are simply and cheaply constructed; are sanitary both in operation and mode of cleaning; and the cost of emptying them is lower than that of most other known methods, since it requires no elaborate and costly equipment on which interest and depreciation charges must be paid.

Water-Meters in Philadelphia

THERE are about 114,000 metered services in Philadelphia, and 11,881 were placed during 1923. The Meter Division tested 12,400 new and 8,250 old meters, removed 7,893, reset 8,023, and repaired 8,143 in the shop and 3,144 on the premises.

There are about 281,000 unmetered services in Philadelphia. The water-rent receipts for 1923 from metered connections totaled \$2,854,-981.20. The corresponding receipts for unmetered connections were \$2,978,223.66. Nearly one-half of the revenue is secured from less than 29 per cent of the total number of services.

The meters are owned by the householders,

and repairs are made by the Bureau at the expense of the owner. The charge for removing, repairing and replacing a ½-inch meter is \$3 plus the cost of new parts, if they are required.

The Meter Repair Division is housed in commodious, well-lighted rooms in the headquarters building, with a full complement of testing and repair apparatus. According to the annual report of Fred C. Dunlap, Chief of the Bureau of Water, for the year 1923, the personnel should be increased, in order to make possible more prompt service in the removal, repair and replacement of meters throughout the city.

Remarkable Mileage of Federal Aid Road Work

DURING the fiscal year ending June 30, 1923, 8,820 miles of Federal Aid roads of all types were completed, which, added to the mileage completed prior to the fiscal year, brought the total of completed projects up to 26,536 miles.

The projects under construction at the close of the year amounted to 14,772 miles and were estimated at 53 per cent complete. In addition to the 26,536 miles completed and the 14,772 miles under construction, there were at the close of the year a number of projects approved but not yet placed under construction, the aggregate

length of which was 6,917 miles. The total cost of the roads completed during the year was \$148,152,528, of which \$63,087,079 was paid by the Federal Government through the Bureau of Public Roads.

	Miles
Graded and drained	1,860.1
Sand-clay	749.5
Gravel	3,815.4
Water-bound macadam	335.6
Bituminous macadam	462.9
Bituminous concrete	76.8
Concrete	1,440.3
Brick	78.8
Bridges	10.8

The Argentine Ant, a Scourge of Many Cities

By W. Dwight Pierce, Ph. D.

Consulting Biologist, Banning, Calif.

A LONG about 1880, there immigrated to our shores from some point in South America a small family of ants, registered in the files of the United States Bureau of Entomology under the name *Iridomyrmex humilis* Mayr, alias the Argentine Ant. They landed at New Orleans and established the family headquarters there. It was not many years before they became the dominant race in that fair city of the South.

These ambitious invaders continued to send out marauding parties, which established themselves in ever-widening territory around New Orleans, until they had invaded and captured all of Louisiana and Mississippi. On and on they spread, until they had gained the Atlantic seaboard in Georgia and South Carolina and had established themselves in cities of Texas.

But such a conquest even was not sufficient for the hordes of Argentinians, as they continued to multiply, and before long adventurous colonies appeared on the Pacific Coast from San Diego to San Francisco Bay. The Argentine ant is now a major problem in many cities from California

to the Carolinas. It is such a problem that it demands the attention of mayors and city councils, city managers, boards of health, and realty boards, and huge sums of money are being spent in many communities to

hold in check the ever - advancing, ever - conquering hordes.

In 1922, New Orleans, on its second year of eradication campaign, raised a fund of \$50,000 to combat the ant, and the entire city was organized into districts, with committees to raise funds. The Mayor issued a proclamation. The newspapers devoted whole pages to the work.

Such campaigns, in a smaller way, have been conducted at Augusta, Ga., Hattiesburg, Miss., and numerous towns in the latter state. In Alameda, Calif., the City Manager sets aside a fund for ant poison, and the Boy Scouts distribute it where needed. Other cities, such as Palo Alto and Hillsborough, Calif., buy

the poison and have city employees put it out. And thus the ant forces itself upon the public attention as a civic problem.

And it is no wonder that this ant pest is a problem, when we ponder on the organization of the invaders.

The Infested Area and the Danger Zone

The Argentine ant is still spreading and there is no present means of knowing how far it can and will spread. For instance, its original habitat is the Argentine Republic, but it now is known to occur in Chile and Brazil, in Cape Colony, South Africa, Portugal, and other parts of Europe, and throughout the Southern United States as far north as Wilmington, N. C., Nashville, Tenn., and the northernmost corner of California at an altitude of 5,000 feet. It is established under a mean annual temperature of 55 degrees, and within the zone of zero minimum temperature. There is all likelihood that if it can stand the extremes of winter it may ultimately become established as far north as the state of Washington, St. Louis, Mo., and Columbus, Ohio. As the ant is a frequenter of houses, greenhouses, factories, etc., it may easily become established in such places and pass a successful winter, and in due time we should find a race adapted to wintering successfully in our northern cities.

Cities desirous of keeping free from the pest should from time to time have an entomological survey made to determine if the ant is present and in the event of finding it, even in small numbers, immediately begin to proceed against it. In the early years of infestation its control is fairly simple.

The Labor Unions of the Insect World

Usually, when we think of an insect, we think of an individualist that lives for itself and its own offspring, and this fits most insects, but not at all the Argentine ants. They are organized in one of the most compact social organizations known. They are the labor unions of the insect world. The success of the colony is the dominant impulse of every individual. Self comes last. Division of labor has brought about supreme efficiency. There is no agreement as to minimum hours or minimum output. They work as long as conditions are favorable for work, and they rest as thoroughly as they work.

The queen is the head of a colony. She alone rules and, through her individual energy, the colony is multiplied. She depends upon her faithful workers to bring her food, and to feed all her young. When dangers threaten they must fight off the enemy if possible. If waters threaten to flood the nest, every worker must help in the removal of the helpless young to a place of safety. If the nest is disturbed, they must move without a moment's delay, and not a single baby ant is left behind. If any of the colony die, they must be removed so that the remainder of the colony will not be contaminated. If the cause of death is suspected, the workers avoid it in the future. There is no shirking of duty. There is, in fact, real intelligence shown by these tiny creatures.

During the active season—and in California and parts of the South there is no inactive season—the queen lays about 30 eggs a day, and in a normal colony has at least 100 workers to furnish the daily provender. As the number of heads to feed becomes greater, the duties of the workers increase. They must get food, or the colony will perish.

A Remarkable System of Foraging

Thus has arisen one of the most remarkable systems of foraging known. From early dawn until sunset there pours forth from each nest, on certain well-defined trails, a stream of ants which may often be traced hundreds of feet. But from this main trail parties go off in every direction, until it is said that in a large infestation not one single square inch of ground, floor or wall surface is unexplored longer than an hour.

Watch the foragers, and you will find one stream headed for a garbage barrel, and the barrel fairly swarming with them. Another stream of foragers are tearing to pieces a dead animal and carrying the shreds to the nest. Here is a trail leading to manure, and another to some excrement.

Here the sputum of a tuberculous person has attracted them.

But look at these trails going straight into the pantries, the sugar barrels, the meat and vegetables, and the bread boxes, depredating and destroying our precious foods, and if we leave them alone they will leave nothing whatever for us to eat.

But how about this? Can we eat

with relish or safety food which has been trodden on, and polluted by their foul-smelling excreta? Can we be sure they did not come to our pantry straight from those germ-laden materials that we saw them visiting? No, on the contrary. Students of disease problems have proved that in cholera-infested sections the ants were carrying the cholera germs and distributing them to food. As long as we keep our municipal premises free of garbage, trash and disease-bearing materials, and just so long, can we be certain of freedom from ant-pollution of our foods. But what city does this?

It is bad enough to see our foods stolen and spoiled, but many householders stop right there, and when they have succeeded



THE ARGENTINE ANT—ADULT MALE

in driving the ants out of the pantry, sit down and congratulate themselves that all is well.

How about it? Count the trails and see where they all lead. Yes, multitudes of trails never enter a house. Multitudes of colonies are camped at the roots of trees, and the workers never have to leave the tree. Multitudes of colonies are located in the strawberry beds, and truck gardens and find enough food right there.

How can that be? Examine the trees. The leaves are covered with sticky stuff and a sooty mold. The tips of the branches are alive with tiny lice, and the foliage is all gnarled and crumpled. The twigs are covered with scale insects, and here and there are great, fleecy clusters of mealy bugs in crevices of bark, on twigs and leaves. And the trees look sick. Watch the trails of ants. They are moving about among these other insects. Here is an ant among the lice. Look through your lens. It is sipping a drop of liquid from a tube on the abdomen of the aphid.

The Ants' "Cows"

Every grower of trees and shrubbery knows that when lice (aphides), scales and mealy bugs are present, his plants sicken and often die from exhaustion of the vital sap. But every grower, and gardener does not know that there is any relationship between the ants and these sucking insects. Ants usually fight and destroy other insects, but, on the contrary, the Argentine ants care for these particular pests. In fact, they shelter them in their nests during winter, carry them out and place them on foliage, transport them to new feeding grounds, kill their enemies and cleanse them of the sugary excrement which constantly flows from their bodies.

It is this sweet substance, known as honeydew, which causes the ants to be so attentive. On the lice, you notice, there are two of these terminal tubes. We can, therefore, readily see why the aphides are called the ants' cows. The mealy bugs and aphides are the domestic animals of the ants, which they pasture out to draw the sweet juices from the trees and convert into honeydew for the ants. The worker ants gorge themselves on this liquid, until their abdomens can hold no more, and then they return to the nest to feed the colony. No matter what the food, it must be first in-

gested by the workers, and then regurgitated by them and fed in droplets to the queen and baby grubs.

The things that go on in the nest are very interesting, but make another story. We are now looking at the practical side of things.

We have seen that the ants invade our homes, taint and pollute, as well as destroy, foods, and that they propagate the worst enemies of our trees and shrubs and gardens. They do more. They actually destroy fruit buds, juicy fruits, strawberries, tomatoes, artichokes, and other vegetables. They may crawl into the ears and eyes of helpless babies. They greatly annoy bedridden invalids. They are a general nuisance.

The Municipal Problem

Let us estimate the ant colony in a city of 100 blocks. Let the average city block contain 20 lots, each 50 by 100 feet. Such lots will average 10 ant colonies of 100 ants each, or 1,000 ants to the lot, 20,000 to the block, 2,000,000 to the city. From about May 1 to October 31, an average of 30 new ants will arrive daily in each of the 20,000 colonies. That is, the city will have 600,000 new ant raiders each day for 6 months, or a total of 108,000,000, in addition to the original 2,000,000 ants, over a million to the city block, 10 to every square foot of ground surface. What chance have you to keep your food, if you do nothing to check this development? It takes a lot of work to catch up with such a multiplication.

And remember that these ants are propagating mealy bugs, in order to insure themselves food. A single female mealy bug may lay from 300 to 600 eggs, and there may be three generations in a year. Such multiplication would give us over 22 million offspring from a single mealy bug female in one year. If the ants are present, the natural enemies of the mealy bug are destroyed by them, and there is no check on the numbers of the pest. It is almost incredible, if we figure an average of even 10 mealy bugs per lot to start, what a mealy bug population we could have in a year.

The multiplication of the plant lice when protected by the ants is even worse, for after they begin to reproduce, a female gives birth to an average of 100 young,

which are mature in 10 days and then begin to reproduce. Think of it—multiplication one-hundred-fold every 10 days! Get out your pencils and see what it leads to. Stupendous! Yes, but look at the tips of the branches and the surface of the leaves, instead of counting the number present, and you will doubtless be glad to leave it to the mathematicians. Normally, parasites and predators check the multiplication somewhat, but the ants prevent such natural checks.

Is it not natural, therefore, that when such an annoying pest is common, realty values are seriously affected, and the reputation of a city as a place to live in suffers correspondingly?

How to Conduct a Municipal Campaign

To conduct a successful campaign, four things are necessary:

1. A director who understands where and how to find the ants and their colonies, and how to adapt his campaign to seasonal and biological conditions.
2. A whole-hearted backing by the community, from officials to citizens.
3. Sufficient funds to adequately cover the entire city with poison syrup.
4. A poison syrup, dilute enough in its toxic ingredient to cause the workers to imbibe freely and frequently, and to feed the entire colony with it before its effects begin to tell. If it is too strong, they will avoid it. And yet it must be strong enough to ultimately kill. It must not decompose, crystallize, ferment, or mold.

For general purposes, the following formula, recommended by E. C. Barber as a result of his experiments at New Orleans, is the most satisfactory:

To add:

To 18 pints water add 12 grams crystallized tartaric acid,
16.8 grams benzoate of soda, and
18 pounds granulated can sugar.

Boil slowly for 30 minutes and cool.

Add enough boiled water to compensate for evaporation.

Dissolve 30 grams chemically pure sodium arsenite (NaAsO_2) in 1 pint hot water, and cool.

Add arsenite to cooling syrup, and stir.

Add to poisoned syrup $2\frac{1}{2}$ pounds good honey, and mix thoroughly.

This is applied at the rate of about one gill per can in 4-ounce flat baking-powder

cans which have been perforated or have the top crimped under the lid to admit the ants. The cans are hung on the shady side of trees and on the houses, or set into the lawns. Sponges floating on the surface, or excelsior, will aid the ants in reaching the syrup.

For an ordinary 50-by 100-foot city lot, about five cans are needed, unless the yard is filled with trees and shrubs. Thus the number of cans to the city can be estimated. The initial cost of materials and of making the syrup will come to about five cents a can. The cans must be filled two or three times during the season, bringing the cost of materials above ten cents a can. The cans should be painted with green paint, or paraffined, to make them liquid-tight and rust-proof.

It is estimated that two men can put out about 1,000 cans a day, but local conditions will greatly modify this. The Alameda way of conducting a campaign is to utilize the services of the Boy Scouts as distributors, assigning each boy a block to watch. He puts out the cans, examines them periodically, receiving a signed statement from the house owner to this effect, and receives special honors as "ant killer," when he has done his work right.

Of course, inspection by experts is necessary to insure completeness, because vacant lots, and lots full of shrubbery, orchards, hedges, etc., are particular haunts of the ants. Results depend upon the thoroughness of application and inspection and capable direction. In gross infestations, it may take two or three years to effect a clean-up, and where neighboring communities are doing nothing, an annual campaign is necessary, because of the spread of the ants by transportation. Ant control costs money, but it is money invested in improvement of lawns and trees, in saving of food and health, and in making a city worth living in.

In California there is a state law permitting the creation of so-called "mosquito abatement districts," which is broad enough in its language and, in fact, was intended to cover the Argentine ant and similar pests. Under this law, when a district is formed and trustees elected, a tax can be levied to cover the cost of insect pest control. California cities should avail themselves of this law in combating the ant.

Reducing Traffic Accidents Through Organized Community Effort

The Second of a Series of Three Articles

By C. W. Price

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THE administrative officials of municipalities can do much to initiate in their respective communities thoroughgoing accident prevention work or to stimulate such work where it has already been started, and for the six reasons pointed out in the first article of this series they should do everything in their power to encourage and vitalize community safety activities. But before city officials undertake active participation in the public safety movement, they must themselves be convinced that it is possible to reduce street accidents, and before they can be convinced, they must know exactly how such reductions have been brought about in a number of cities. This article will discuss briefly the fundamental principles of traffic-accident prevention, the methods that have proved successful in cities representing practically every condition of life in America, and the agencies that must be utilized to put those methods into effect.

Men who have had occasion to watch the development of industrial safety are agreed that the success of that movement is due primarily to the fact that the pioneers in the movement worked out a safety program which is simple, which can be used in any plant, and which always gets results. For years it has been possible to go into any plant and say to the general manager: "If you do these five or six things, do them sincerely and consistently, you will reduce accidents in your plants 50 to 75 per cent." And thousands of plants have done just that.

The men who have been identified with the public safety movement since its beginning have been convinced that the only hope for any real progress lay in the possibility of developing a program of community safety as simple, as flexible, and as sure of results as the industrial safety program. Experiments in this direction have

been tried in some two dozen cities. While many of these campaigns were fairly successful, it could not, until a year or so ago, truthfully be said that there had been developed a simple, workable plan for a public safety campaign which could be applied to a city of any size with the assurance of results in every case. In the last two years, however, out of the experience of many cities, there has been developed a program which discards the scores of trivial activities that characterized the early campaigns, and retains only those five essential activities that have been found to be of permanent value in every city in which they have been tried.

The most important lesson that has been learned in the first five years of the public safety movement in America is to utilize in each community certain existing civic agencies and to function them as great pieces of machinery which, when set in motion, are capable of reaching automatically, economically and continuously thousands of persons and impressing them with their personal responsibilities and opportunities for the prevention of accidents. The public schools constitute one such machine; the newspapers another; the police a third; motor trucks, taxicabs, and other commercial vehicles which are constantly on the streets, a fourth; etc. These agencies, and many others like them, exist in every community; the problem is to utilize them for the purpose of accident prevention without interfering with their normal functions. Not only has this been done successfully in many American cities, but the injection of safety work in the routine activities of these agencies has vitalized and enhanced their ordinary functions.

To utilize the existing machinery for reaching large numbers of people daily, it is necessary to establish a safety clearing-house or safety service bureau, preferably

as a department of some existing organization such as the chamber of commerce or the local automobile club. It is inadvisable, in most cases, to create a new organization; it is the universal sentiment among business men that there are already too many civic, social and business associations.

The activities which have been found to be the determining factors in the success of any community safety campaign have been so refined and standardized as a result of their use in more than twenty cities during the last five years that, given the proper leadership, practically the same results can be achieved in any community.

City officials and officers of local chambers of commerce have supplied such leadership in at least half of the cities which have done successful safety work during the last few years. The Mayor, the Chief of Police, the Superintendent of Schools, the Street Commissioner and the President of the Chamber of Commerce should be among the prime movers of a public safety campaign in every city where such a campaign is started.

Safety Week

The experience of practically all of the cities which have undertaken permanent safety campaigns shows that the first essential is a Safety Week campaign, the effect of which is twofold: first, to attract

wide-spread attention to the permanent campaign; second, by a striking demonstration in the reduction of accidents during that one week, to convince the people that it is possible to prevent accidents and to convince them of this fact so strongly that they say: "Why stop with a Safety Week? Let's have a safety campaign throughout the year."

This is evidenced by the experience of five cities which represent practically every condition found in any city in the United States: New York, the metropolis; Washington, the residence city; Pittsburgh, the great industrial center; Louisville and Baltimore, where traffic conditions are typical of a hundred American cities. In each of these cities a Safety Week campaign was conducted within the last year, with the following results:

ACCIDENTAL DEATHS			
	Safety Week	Corresponding Week	Per Cent Reduction
New York	30	70	57
Washington	2	6	66
Pittsburgh	9	22	60
Baltimore	2	9	77
Louisville	1	3	66

These campaigns have demonstrated that more can be done in one week's intensive effort to convince all of the people that accidents can be prevented and to give wide-spread publicity to the safety movement than can be accomplished in an entire year



VISUALIZING SAFETY ON THE STREETS

The use of striking safety posters on poster-boards at street intersections, on street cars and on commercial vehicles

of ordinary effort. But an accident-prevention campaign which begins and ends with a Safety Week is worse than no campaign at all.

Safety Education in Public Schools

Students of the traffic-accident problem and investigators of traffic-accident causes are immediately struck by the fact that approximately a third of all automobile accident fatalities are among children. The one underlying reason for this is that the child is largely a creature of impulse; he does not know one minute what he may do the next, nor does the driver in front of whose vehicle he dashes after a ball or a playmate. There is only one cure for this situation, and that is to build up in the children of to-day a new set of habits which take into account the changes that have taken place since their parents were children. Toward this end there has been developed by Dr. E. George Payne, Professor of Education at New York University, a system of safety instruction in public schools which provides for the use of safety material in each of the existing studies. To illustrate: at least once a week in the drawing class each child designs a poster on safety. I have seen posters illustrating every kind of hazard, from stealing a ride on the back of a truck, to the right and the wrong way of crossing a street. In the writing lesson the children copy such sentences as this: "When I start to cross the street, I look to the left, and when I get to the middle of the street, I look to the right." In each schoolroom a safety patrol is appointed to guard the streets when school is dismissed, and to warn the children against crossing the streets when motor vehicles are approaching.

Through such activities safety is made a vital part of the child's daily life. The incorporation of this plan in its public schools enabled St. Louis to reduce fatal accidents to children from 49 to 18, and Detroit its child fatalities from 96 to 30 in the face of great increases in the number of motor vehicles; it enabled Washington, D. C., in the first nine months following the inauguration of a permanent public safety campaign, to reduce its accidents to children by 50 per cent.

Visualizing Safety on the Street

In the development of public safety the question which has claimed attention more



A MOTHER TEACHING HER CHILDREN THE IMPORTANT LESSON THAT IN CROSSING THE FIRST HALF OF THE STREET THEY SHOULD LOOK TO THE LEFT, AND ON THE SECOND HALF TO THE RIGHT

and more is how to visualize safety, how to keep safety continuously and impressively before the people while they are on the streets. Professional public-safety men are now agreed that a year-round poster campaign presents the best solution of this problem.

If safety posters are to be effective for the persons who see them; if they are to be acceptable to the persons who are to authorize their placing; and if they are to keep up the interest of the community continuously, they must be done artistically and they must have "pep." No ordinary printing job or hastily written copy will do. The experiences of St. Louis, Milwaukee, Boston, Baltimore, Louisville and Washington, all point to the need of a year-round poster campaign for the prevention of street accidents. The posters should be prepared in three sizes, the largest for display at the more important street intersections, entrance highways to the cities, entrances to factories and schools, gasoline filling stations, public garages, in all public buildings and on vacant bill-boards. There should be a series of medium-sized posters for display

on the front of every street car. Still smaller posters should be used on commercial vehicles. The color of the poster, the illustration and the text should be changed each month.

Half of the posters should be directed against the pedestrian and half against the driver. Such slogans as: "The Reckless Driver Is a Criminal," "The Jaywalker Is Taking a Short Cut to the Hospital," and "Fools Used to Blow Out the Gas, Now They Step on It," together with bold illustrations visualizing the text, compel attention and exert their influence on driver and pedestrian alike. The very fact that a warning against carelessness is posted on either side of his vehicle tends to make the individual truck driver careful, even though the warning is directed against the other driver or the pedestrian. And when the jaywalker or reckless driver reads a safety message which is posted on a truck, he gets not only the message, but a vivid picture of what is likely to happen to him if he disregards it when that particular truck is headed his way. When such posters are widely distributed over the city, it is not possible for a driver or a pedestrian to come down into the heart of the city without being reminded a dozen times of the idea of safety; and he is reminded at the very points where the hazards are greatest. The driver may read accounts of automobile accidents while he sips his breakfast coffee, and by the time he backs his machine out of the garage he has forgotten them. But if on his way down town he is confronted at every dangerous street intersection with the accusing indictment, "The reckless driver is a criminal," he is compelled to think of safety. In the early part of the Washington campaign a prominent business man said to a friend, "I am a reckless driver; I'll admit it. But those posters on the street have got me. Every time I face one going down town I slow up."

An analysis of motor vehicle accidents in

New York City during one recent year revealed the fact that 53 per cent of the deaths resulting from all motor vehicle accidents involved commercial vehicles. The significance of this will be appreciated when it is recalled that commercial vehicles constitute approximately one-tenth of the total motor vehicles of our streets and roads.

Except through a general education it is difficult to reach the drivers of private passenger cars with any direct safety training. But it is possible, through their employers, to gather large numbers of drivers of commercial vehicles into a school for group instruction. The drivers of commercial vehicles are, in proportion to their numbers, the largest users of streets, and once interested in accident prevention they are in a position to do more than any other group of drivers to reduce the hazards of the street.

During the past four years schools for motor vehicle drivers, especially drivers of commercial vehicles, have been conducted in a number of large cities, including Washington, Chicago, Detroit, Milwaukee, and St. Louis, and always with large attendance

and with far-reaching results. The experience in these schools has demonstrated that drivers can be reached and interested in safety just as quickly and quite as effectively as workmen have been reached in industry.

In the effort to reach every commercial-vehicle driver, these cities have found it even more important to place in the hands of every employer of drivers information which will not only convince him of the value of organized safety work but will equip him personally to instruct his drivers and to organize safety on a permanent basis in his own concern.

Help from the Newspapers

In an organized community effort for the prevention of traffic accidents, the newspapers constitute one of the most direct and effective mediums through which to carry



POSTER USED IN SAFETY CAMPAIGN IN LOUISVILLE, KY.

Reproduced in three different sizes, for use on commercial vehicles, or street cars, and at street intersections

the safety message into the homes every day in the year. Because of the alarming increase of accidents and the aroused public interest, the newspapers in most communities are willing and glad to sponsor safety campaigns just as they sponsor a campaign to combat any evil that menaces the life of the community. In order to secure the intelligent and whole-hearted cooperation of the newspapers, however, it is necessary thoroughly to acquaint their editors in advance with the plan and purpose of the campaign, and to give the newspapers, not what is ordinarily known as publicity material, but articles and photographs of real educational value.

Not only the detailed plans of the activities which have been found to be successful in a number of cities, but the actual materials used are now available for any community. And with such plans and materials it is possible for the average American city to conduct a year-round carefully organized public safety campaign for less than the cost of one fatal accident. Exactly how any city of 25,000 or more population can organize and conduct a safety campaign along these lines and secure for such a campaign the hearty cooperation of the important business interests and the community at large will be described in the next and last article of this series.

Winnipeg Launches a Central Steam Heating Project

By J. G. Glassco

General Manager, Hydro Electric System, Winnipeg, Man.

THE Winnipeg Hydro Electric System, having built a steam standby plant within the city limits as a protection against interruption of service on the Hydro transmission lines, was faced with the problem of taking care of very heavy additional fixed charges, approximating some \$75,000 per year. It was felt that some means should be adopted, if possible, to relieve the Hydro of this burden. An investigation was made of the possibilities of central steam heating, with a view to using the new boiler equipment of the standby plant for revenue-producing purposes. The results of the investigation looked so promising that the services of Messrs. Neiler, Rich & Company, consulting engineers, of Chicago, were obtained for the purpose of advising as to whether a central steam heating plant for the city of Winnipeg would be a practicable, sound business proposition. The report of the experts was so favorable that a by-law was placed before the electors at the municipal elections in 1923, and the undertaking was then approved by a large majority. This by-law, which was for the expenditure of \$889,196, stipulated that \$325,000 which was already being spent by the Hydro for boiler equipment should be charged to central steam

heating account, thus leaving a net sum of \$550,000 to be raised.

Apart from the general advantages of central steam heating, such as elimination of smoke nuisance and coal- and ash-handling and the considerable saving to be made in heating costs, there were many factors which influenced the electors in voting in favor of the by-law. Some of the more important were as follows:

1. The Hydro would sell to the central steam heating plant off-peak electrical energy which would be used, when available, instead of coal, for steam production purposes. This would produce a revenue of approximately \$75,000 per year.

2. The fixed charges on the boiler equipment would be taken care of by the heating system, thus relieving the Hydro of the annual charges of \$34,000.

3. With the boilers always under steam and ready for immediate demand, the high-pressure fire protection plant could be completely electrified, resulting in a reduction in operating costs to the extent of \$63,000 per year.

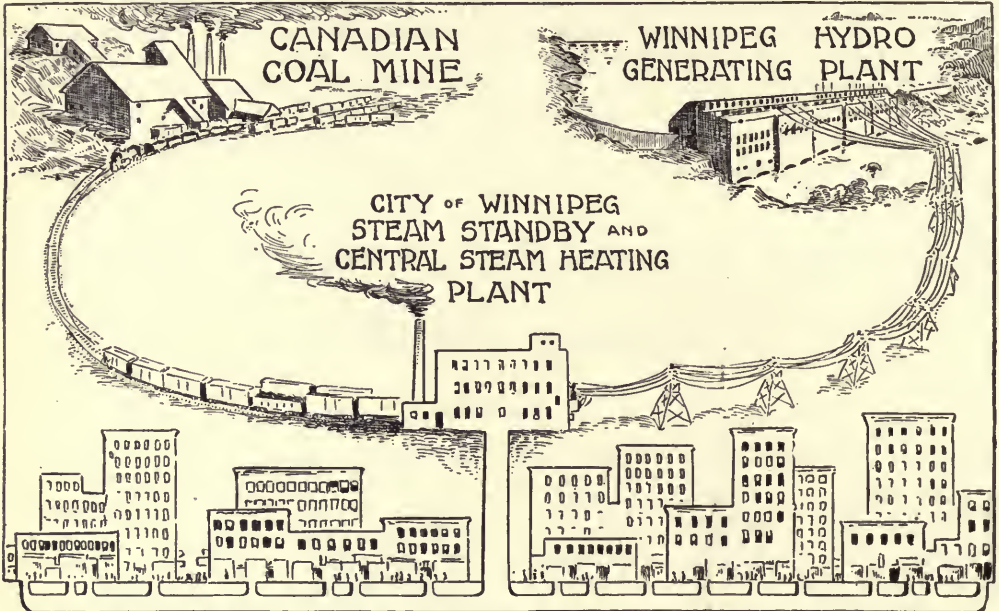
4. The water-works steam reserve plant would be eliminated, this service being supplied from the standby plant, with an estimated saving of \$8,000 per year.

5. The development of Canada's natural resources by the utilization of the low-grade slack coal of the western mines, thus reducing the importation of thousands of tons of American coal now being used in individual heating systems.

Under the scheme as outlined, it is proposed to use pulverized lignite coal, which recent developments have proved will give

an economic possibility.

Winnipeg has a very great advantage over the other large cities that have made a success of central steam heating, inasmuch as we have a very low average temperature during the winter months and a long heating season, resulting in the use of the heating system for a much longer period for practically the same capital ex-



HOW COAL AND WATER POWER WILL UNITE IN WINNIPEG'S CENTRAL HEATING PLANT

as high an efficiency as some of the best-grade American coals. Endless quantities of low-grade lignite coal are available on the western boundaries of Manitoba at a cost of about \$4 per ton laid down in Winnipeg. This, supplemented whenever possible with all the available off-peak energy from our hydraulic power development on the Winnipeg River, will be a large factor in making the central steam heating plant

penditure as would be required elsewhere.

It is estimated that it will take five years to develop the system to its full extent, the city being divided into several districts and extensions being made annually until the whole business area of the city is covered.

There is no doubt that the progress of this new municipal undertaking will be watched with interest throughout Canada and the United States.

Progressive Cities Don't Have Blind Babies

THERE was once a time when a quarter of all new-born babies developed "sore eyes," ophthalmia neonatorum. Many of these babies were blinded for life. They formed a third of the whole burden of disability born by nurseries, schools and homes for the blind as well as by their own families. A few days ago, the Chicago Board of Health reported that, to the best of its knowledge, not one of the 56,724 children born in that city in 1922 has lost his sight. Cleveland believes that it has no blind child of less than three years. Massachusetts has not recorded an instance of

the infection for more than five years. Grand Rapids has had a clean slate for so long that there is no case of blindness among its school children. Within the lifetime of the pioneers, such as Dr. F. Park Lewis and Louisa Lee Schuyler, who worked for the first legislation—the New York State law of 1890 which required notification of the condition—an unending campaign of education, lawmaking, and enforcement has demonstrated once more the truth of the credo that public health is purchasable—whenever we care enough to work to get it.

—From The Survey for January 15, 1924.

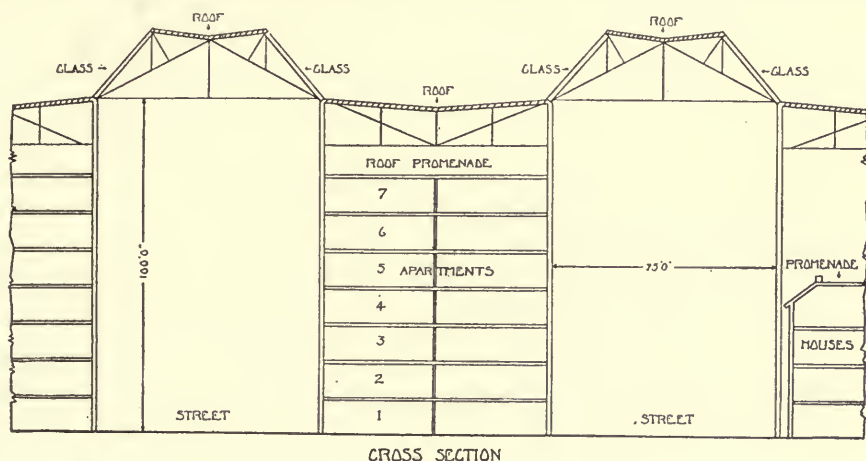
Will Future Cities Be Under Glass?

ENCLOSING an entire section of a city—a half-mile square, for example—roofing it under glass, and heating the whole neighborhood to a comfortable degree, is the interesting suggestion of Samuel R. Lewis, of Chicago, a member of the American Society of Heating and Ventilating Engineers, whose paper on the subject is published in the November issue of the *Journal* of that organization. The paper goes into considerable detail as to methods of construction, costs, and economies as compared with present methods of heating. Some of Mr. Lewis' arguments for his pro-

and the like. The roof is to be about 100 feet above the ground, and great monitors 150 feet on centers run north and south, having high glass sides, so that the direct sunshine may transverse the entire area at some time every day. The glass will be triple, with cleaning galleries between the sheets, and will be hinged so as to be opened in summer.

"The structure with its heating would cost not to exceed \$2.50 per square foot of area, or \$16,735,000. All work done inside the structure will cost much less than the same work outside, because work can be carried on every day, regardless of outside weather conditions.

"We must always have heated buildings, because through more than half of every year we would suffer, and many of us would die



posed giant conservatory are here quoted:

"If we build this structure of the highest reasonable grade of construction now commercially possible, we might make the structures within its shelter the lightest of shells, built for privacy only. If the enclosure is lofty, no mechanical ventilation will be required, as the difference in temperature between the enclosure and outdoors will cause a rapid air change. Dust, temperature, humidity and even air motion can be controlled by artificial showers of rain, whenever these are needed, from sprayheads in the roof. Ponds of water may be utilized on the roof for their benign value in temperature regulation. Substantial reductions in the cost of living can be made by the garden truck which can be grown on the inner roofs and in the back yards. Any one wishing cold air may dress for it and pass outside.

"After much study and several sketches, I worked out as a sample, to satisfy my curiosity, a scheme for an enclosure approximately one half-mile square, 2,625 by 2,500 feet. It is to be arranged with steel columns 75 feet on centers, with a chimney at each column to care for the venting of kitchens, toilets, garages,

otherwise. We spend by far the greater part of our time in small spaces without vegetation, often without air movement and frequently with insufferable odors. Why not, since we must recognize these facts, meet the issue in an efficient way by housing in great spaces, doing away with little enclosures? The canyons of streets and alleys between our modern city buildings are exceedingly inefficient and wasteful from every standpoint. If we roof them over with glass we can save the burning of great quantities of coal, thus saving some of the soot and dust. Much less labor will be required to clean the glass than is now used cleaning windows and streets. Flying bridges here and there between buildings will save much street congestion and much elevator service. The snow-handling problem of cities will be simplified wonderfully, as the snow can be removed without interference with traffic.

"I'll grant that it may be a few years before my sixteen-million-dollar, half-mile-square project will be floated, but I predict that the roofing over of streets in metropolitan districts will come quickly. The saving in heat will finance the construction."

Roughness as a Factor in Pavement Life

By A. T. Goldbeck

Bureau of Public Roads, U. S. Department of Agriculture, Washington, D. C.

THERE are certain types of road roughness, such as the inequalities in a concrete surface due to slightly projecting fine or coarse aggregate or to the brooming of the surface after finishing; the slight roughness of brick pavements due to the joints; and roughness of a similar kind in other types of roads; all of which are of little consequence in this discussion. Such slight inequalities are readily absorbed through the depression of the rubber tires, and very little vertical motion is imparted by them to the vehicle.

Roughness in Concrete Roads

There seems to be little excuse for roughness in new concrete roads constructed with the most modern methods, and yet there are many roads which, through lack of attention to every detail, are not smooth riding. Roughness in a concrete road can very readily occur if the side forms are insufficiently supported, or not sufficiently rugged, especially when a finishing machine is used, or when they are carelessly placed. Even with the smooth finish which can be accomplished, both by hand and by machine methods, a concrete road surface may still develop unevenness due to lack of homogeneity of the mixture or a non-uniform consistency, resulting in settlement of the concrete in some spots more than in others. The difficulty of maintaining a smooth surface in concrete laid on steep grades is also well known.

Especially during cold weather, which interferes with rapid setting, motion of the concrete is apt to take place on hills, causing the formation of a series of waves. The difficulties of obtaining evenness at expansion joints have not in all cases been overcome. After several years of service, additional inequalities may develop due to subgrade settlement, slipping at expansion joints or heaving, or to incipient blow-ups from temperature and moisture expansion.

Rough Roads Are Rough on Traffic and on Themselves

From the standpoint of the road user, there can be no question of the desirability of as smooth a riding surface as can be produced. The instant a rough stretch of pavement is encountered, the vehicle driver is made conscious of it by reason of rapid, unpleasant vertical motion which is imparted to the entire vehicle, and a portion of which, at least, reaches the driver. He knows the exhausting effect on himself of a rough road in comparison with that of a smooth one. The vehicle owner also is quite conscious of the increased maintenance cost on his vehicle resulting from rough roads. What does this mean in terms of the life of the pavement itself?

Roughness in Bituminous and Other Types

The bituminous types are likewise difficult to finish with the desired degree of smoothness, and when the mixture or workmanship is not proper, waves develop under the combined action of traffic and warm weather. In addition, subgrade settlement is more apt to produce inequalities in roads of the flexible type than in the rigid

type of pavement.

The chatterbox surface which develops in gravel roads is well known, and its effect on both the driver and the vehicle are quite apparent. Such waves seem to be caused by the combined action of the springs and the spinning of the wheels, and they increase very rapidly unless the surface is constantly maintained. Similarly, the other types of surfaces under the action of traffic and the expanding action of heat and moisture, both in the road surface and in the subgrade, in time develop roughness

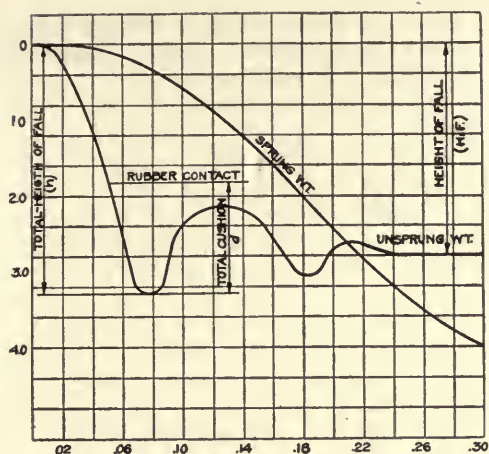


FIGURE 1. THE MOTION OF THE HUB AND BODY OF A TRUCK IN GOING OVER AN OBSTRUCTION

of different kinds and degrees, even though they may have been reasonably smooth just after construction.

Effect of Road Roughness

Let it be assumed that a high joint has developed in a concrete road and that a motor vehicle is traveling in the direction from the high side of the joint. Figure 1 illustrates the motion taken by the hub of the wheel and by the body of the machine during the time of free fall of the wheels. When the vehicle is running at high speed, for an instant the tire will be out of contact with the road surface, but immediately the force of gravity and the force due to the compression of the truck spring shoot the unsprung weight of the vehicle downward with high velocity. The body of the machine falls downward very much more slowly, since it is acted upon downward by the force of gravity alone, and this is counteracted to some extent by the upward force of the springs. When the tire comes into contact with the surface, pressure on the road is developed, which increases rapidly as the tire is compressed, and finally reaches a maximum value under the greatest flattening of the tire. The high vertical velocity of the wheel due to the kick of the spring and force of gravity is reduced to zero during the extremely short interval required to attain extreme compression of the tire. In other words, the unsprung mass of the vehicle has been decelerated and the pres-

sure between the tire and the road surface has increased from zero at the time of initial contact to a maximum at the time of full contact.

The maximum pressure created on the road surface is entirely dependent upon the deceleration or rate of change of vertical velocity, on the mass of the unsprung portion of the vehicle, and on the spring pressure at the instant of maximum compression of the tire.

It is not necessary that sudden inequalities be present in a road surface to produce greatly increased pressure on that surface. Let us assume that a heavy vehicle is traveling at 20 miles per hour and that there is a rise in the road surface of $\frac{1}{4}$ -inch in a distance of 1 foot. Let the unsprung portion of weight on one wheel be 3,000 pounds, and the sprung portion 6,000 pounds. Omitting tire compression, the vertical acceleration of the unsprung portion equals approximately 37.5 feet per second. The force on the road surface equals 12,480



FIGURE 2. A GRAPHIC STRAIN GAGE IN POSITION ON THE UNDERSIDE OF A CONCRETE SLAB

pounds, as compared with 9,000 pounds, the static weight of the vehicle. This would be the force created if the tire were of steel instead of rubber. The effect of the rubber is to decrease the vertical motion of the unsprung portion of the vehicle, thereby somewhat decreasing the pressure on the road surface.

It is likewise conceivable that a wave in a road surface will lead to impact when the speed is so high that the inclined approach of the wave shoots the wheel entirely free from the surface so that it lands with a free fall.

Measurement of Impact on Road Surfaces

In 1921 a large series of tests were completed by the Bureau of Public Roads, in which it was demonstrated that rather high impact pressures were produced on the road surface under conditions of artificial roughness. These measurements were made by determining the pressure required to permanently deform a small copper cylinder placed under the plunger of a hydraulic jack buried under the road in a position to receive the impact of the motor vehicle. As a result of this series of tests, the following conclusions were at that time drawn:

Impact depends largely upon the kind and condition of the tire.

Thin or worn solid rubber tires, even though they be very wide, produce very high impact forces.

Pneumatic tires offer the greatest influence in reducing impact forces, and with their use the impact increases only very slightly with the speed of the truck.

Cushion tires, that is, tires having a

degree of softness and deflection between solids and pneumatics, offer corresponding advantages in reducing impact.

Impact increases with the speed of the truck, but it cannot be said to increase according to any constant ratio or power of the speed.

Although heavy unsprung weight may give higher impact than lighter unsprung weight, it cannot be said that this is the major controlling factor.

The relative destructive effect produced by light-weight, high-speed trucks and heavy, slow-moving trucks has not been determined by these tests. They do, however, indicate that equal impact may be obtained under some conditions.

Impact may be as high as 7 times the static load on one rear wheel when a solid-tired truck strikes a 1-inch obstruction at 16 miles per hour, an average value being about 4 times. For pneumatic tires the maximum impact value is probably not more than $1\frac{1}{4}$ times the load at one rear wheel, and an average value is not more than $1\frac{1}{4}$ times the load.

All cushion wheels do not reduce impact on the road surface, even though they may cushion the vehicle.

These tests, of course, were run with artificial obstructions and depressions in the road surface, and the question naturally arises: Are actual road surfaces likely to produce any such impacts as indicated by this series? To answer this question, impacts have been measured by the use of an accelerometer mounted on the rear axle in a position to measure the vertical deceleration of the unsprung portion of the vehicle in striking the road surface. The path taken by the hub of a motor truck wheel in striking the surface and the manner of calculation of the impact pressure have already been indicated.

Tests were made by running different sizes of motor trucks over typical concrete roads and noting the maximum reading of the accelerometer. The unsprung and sprung weights of the vehicle and

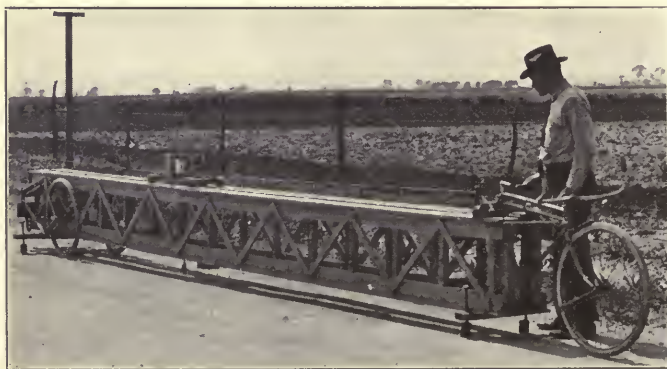


FIGURE 3. THE PROFILOMETER USED ON THE BATES EXPERIMENTAL ROAD IN ILLINOIS

the acceleration as determined from the accelerometer being known, the impact pressures were then calculated, and it has been found that on typical concrete roads that have been in service up to four or five years considerable impact pressure can be developed. Tentatively, it can be stated that the maximum pressures to be expected under the rear wheels of the motor trucks are as follows:

2-ton.....	18,000 pounds
3-ton.....	24,000 "
5-ton.....	30,000 "

Additional tests are now under way which will throw more light on the accuracy of these figures. These pressures correspond reasonably well with the pressures found by the use of the copper cylinder measurements already mentioned, and correspond to heights of fall of the rear wheels well up to 2 inches, as determined in the old copper cylinder tests.

The Effect of Impact on the Stress in Concrete Roads

It would seem to follow that the higher the pressure created on a road surface, the higher should be the stresses created within the surface, and, in general, the more rapid should be the deterioration of the surface. Road materials differ very widely in their characteristics. Thus, concrete is perhaps the most elastic of the road surfaces in the sense that definite deformations are to be expected with definite increase in load. The bituminous surfaces behave more like a plastic material, the degree of plasticity changing with the temperature. Macadam, gravel and sandy-clay follow the laws which govern masses of granular materials, and they possess elasticity and plasticity to a very limited degree.

The nature of the effect of the impact of traffic produced by roughness in these different surfaces will therefore be different, depending upon the type of surface. Since concrete is of an elastic nature, it offers the possibility of making accurate measurements of stresses produced by traffic forces; the relative stress effect produced by different degrees of roughness can therefore be very accurately determined in a concrete road, and the stress produced furnishes a measure of the degree of destruction likely to result in the road surface.

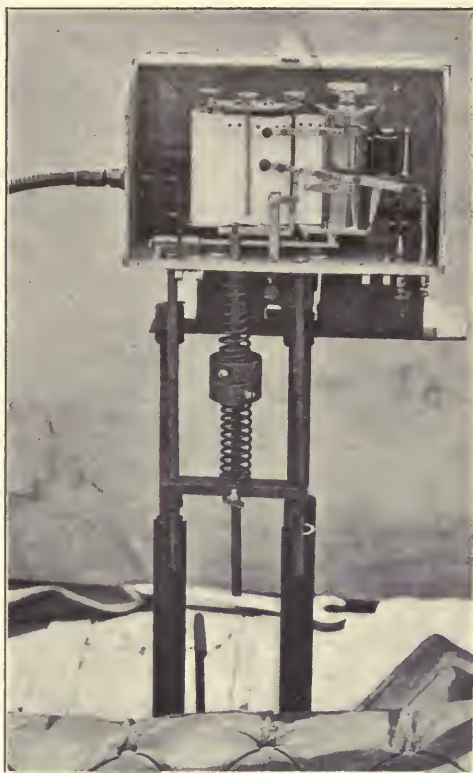


FIGURE 4. RECORDING ACCELEROMETER

Measurement of Fiber Stresses in Concrete Roads Produced by Impact of Motor Trucks

For measuring the stress or deformation in the road surface, recording strain gages were set along the edge and as close to the bottom of the slab as possible. A view of one of the instruments set in position on the underside of the slab is shown in Figure 2. Similar instruments were placed at the edges of pavement slabs 4, 6, 8 and 10 inches in thickness built for test purposes on several kinds of subgrade. A motor truck equipped with solid tires was then run at speeds of 2, 10, 15 and 20 miles per hour, with the center of the rear wheels 9 inches from the edges of the road. Over each position of the strain gage an obstruction was placed on the road, consisting of a metal plate 3 inches in width, with thicknesses of $\frac{1}{8}$ -, $\frac{1}{4}$ -, $\frac{3}{8}$ -, and $\frac{1}{2}$ -inch for the different conditions of operation of the motor truck.

These tests showed that for a given speed the stress always increases as the

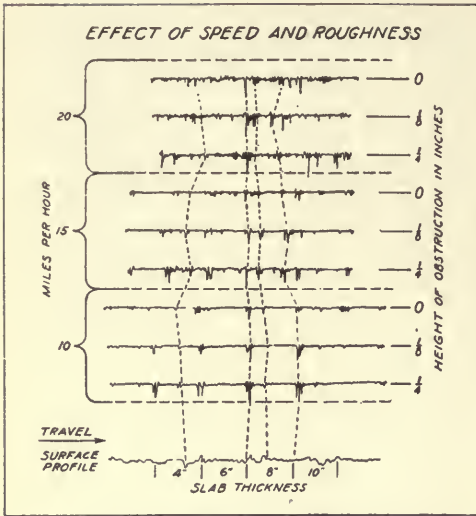


FIGURE 5. THE RECORD PRODUCED BY A RECORDING ACCELEROMETER

obstruction increases in height and, as might be expected, the effect is much more severe on the thinnest slabs. It is evident that the fiber deformations may be at least doubled when an obstruction of $\frac{1}{2}$ -inch occurs in a concrete road and the truck is caused to mount over that obstruction. Any condition which would make the truck wheel fall through the same distance would give very similar results. Apparently, for small roughnesses up to, say, $\frac{1}{4}$ -inch, the increase in stress with speeds up to 15 miles per hour is quite small with all the thicknesses of slabs, but when the speed becomes higher than this, the stress curves show a rapid increase in stress as the speed increases. The $\frac{1}{2}$ -inch obstruction even at low speeds produces a very much higher stress than found in the smooth slab, and, moreover, the stress increases very rapidly with the speed.

In calculating stress it has been assumed that the modulus of elasticity of the concrete was 3,000,000 as determined in a static load test. It will be noted that the stresses obtained in this way in many cases exceed 700 or 800 pounds per square inch, the probable modulus of rupture of the concrete. The fact that no cracks are apparent in spite of this high stress needs more investigation to arrive at a satisfactory explanation.

According to investigations on the fatigue of concrete made at the Illinois State High-

way Department laboratory, it seems that under repeated loads failure takes place under a comparatively few applications of loads producing a stress in excess of 5 per cent of the modulus of rupture. In the absence of more exact information on the relative stress at failure under impact and static loads, it would seem safest to accept half of the modulus of rupture as the safe unit stress produced dynamically as well as statically. If 800 pounds per square inch is the modulus of rupture of the concrete, the safe unit stress would then be 40 pounds per square inch; thus a 5,000-pound wheel load stressed the 4-inch slab beyond safe limits even when no artificial impact was produced. The 6-inch slab became unsafe with an $\frac{1}{8}$ -inch roughness at 20 miles per hour, and with a $\frac{1}{4}$ -inch roughness at 10 miles per hour. The 8-inch slab began to receive an unsafe stress at 20 miles per hour with a $\frac{3}{8}$ -inch obstruction, and with a $\frac{1}{2}$ -inch obstruction at 10 miles per hour. The 10-inch slab was not overstressed with a $\frac{3}{8}$ -inch obstruction at 20 miles per hour, but with a $\frac{1}{2}$ -inch obstruction was overstressed at about 13 miles per hour. It is thus apparent that the deteriorating effect of roughness is different depending upon the thickness of the slab.

The effect of roughness on the deterioration of pavements of the bituminous type is a matter of common observation. Every one has observed the depression formed in the best types of asphalt pavements on the far side of manhole covers in city streets. The slight impact of traffic results in the production of impact pressure which the pavement cannot resist in its most plastic condition. Depressions in asphalt pavements resulting from any cause, whether from a local settlement, improper mixture or rolling, lead to impact with a resulting increasing roughness of the pavement and deterioration, whose progress will be rapid under heavy wheel loads and high temperatures.

The growth of washboard effects in gravel roads is known to be very rapid after a slight roughness once forms, and this growth may proceed from the formation of a single low spot which produces a succession of impacts of the vehicle wheels. Under average speed conditions the wheels land at approximately the same spots in the road, and on landing, the spinning

wheels displace some of the road surfacing material, thus forming the waves with crests of loosely compacted gravel and troughs with material in a well-compacted condition. The higher the waves, the harder the impact becomes and the faster the surface deteriorates. All of the evidence then points to the desirability of not only producing a smooth surface initially, but by maintenance measures keeping that surface as smooth as possible.

Devices for Measuring the Roughness of Roads

Within the last few years several devices have been proposed for obtaining a measure of the roughness of roads. One of these devices, developed by the Bureau of Public Roads and assembled by the Illinois State Highway Department, is shown in Figure 3. It consists of a frame which may be set up on the road surface in the position desired and which then serves as a smooth trackway over which is run an auxiliary truck upon which is mounted an autographic device for recording the movement of a tracer wheel bearing on the road surface. The tracer wheel is drawn from one end of the frame to the other. The frame is then transferred to another position and the record thus obtained.

A similar device using the same kind of automatic recorder has been used in experiments conducted by the Iowa State Highway Department. Both of these devices record the absolute roughness of the road. Still another device used by the Bureau of Public Roads is shown in Figure 4. It is mounted on a frame connected with the axle of a motor truck. A weight suspended between an upper and a lower spring serves to produce vertical motion of the recording pen as the entire apparatus follows the vertical motion of the axle of the vehicle.

The recording drum is moved by means of the speedometer cable. This same type of recording apparatus may also be mounted in the body of the vehicle, and the vertical motion of the axle with respect to the body is then readily transferred to the recording apparatus. This device may also be fitted with an auxiliary attachment for accumulating the vertical motion of the axle. When this device is used, it is necessary, of course, that the vehicle be run at a constant speed and that the tires and springs be kept under uniform conditions. The record obtained does not give an absolute measure of the roughness, but does give a relative measure of the roughness, and the record of the vertical motion accumulating attachment gives an index figure which is indicative of the relative roughness of the various types of roads. Such a device was built by the Bureau of Public Roads several years ago and has since independently been made available in commercial form.

In Figure 5 are shown typical records obtained with the instrument shown in Figure 4. A 5-ton truck equipped with new solid tires was used in the test runs. A profile of the road obtained by precise levels at 6-inch intervals is plotted at the bottom. Each peak in the records indicates an impact due to roughness, and the higher the peak, the greater has been the blow struck by the truck wheel. In general, note that:

(1) Even a seemingly smooth road surface will have appreciable roughness.

(2) The higher the speed, the greater and the more frequent will be the impacts delivered to the surface by the trucks.

(3) The rougher the road, the greater are the impacts, as shown by the increased height of peaks with $\frac{1}{8}$ -inch and $\frac{1}{4}$ -inch obstructions.

ACKNOWLEDGMENT.—From a paper delivered before the American Road Builders' Association, at Chicago, Ill., January 24, 1924.

Gases in Street Manholes

ATMOSPHERES in telephone manholes in Philadelphia have been examined for the presence of carbon monoxide by the Department of the Interior, acting through the Bureau of Mines. The Hoolamite detector and a newly devised bomb tester for explosive gases were used. The bomb is made of pipe fittings, spark plug, automobile spark coil and dry cells. Of 13 manholes in different parts

of the city, suspected of being gaseous, 12 contained irrespirable atmospheres, and two of these were explosive. Eleven holes were tested at random and 8 showed dangerous quantities of carbon monoxide. Workmen at Philadelphia ventilate gaseous manholes before entering, with sails or a rotary hand-driven blower, similar to a blacksmith's forge blower. This safety measure affords adequate protection.

The Design and Operation of Sewage Pumping-Stations

By C. S. Timanus

Burns & McDonnell Engineering Company

WHILE the art of pumping water has been practiced for hundreds of years, the lifting of sewage by mechanical means was little used until comparatively a few years ago. The progress in the design of machinery for handling sewage began with the universal adoption of the water carriage system of sewage disposal and has since kept pace with the wide-spread demand for better sanitary conditions. There has been much discussion of the proper method of pumping sewage: first cost, reliability, economy of operation and sanitary features are the important topics of interest and discussion.

Reliability is, perhaps, the most important of these elements, while the sanitary features of a plant rank as a close second; indeed, the two elements are very intimately related. An unreliable plant may easily become the cause of unsanitary conditions and a nuisance. On the other hand, a plant may be dependable—always capable of handling all the inflowing sewage—but, nevertheless, a nuisance on account of unsanitary receiving wells, trash racks, or bar screens.

Secondary in importance to the reliability and sanitary features of a plant come its first cost and economy of operation. Theoretically, the allowable first cost depends on the economy of operation, and operating economy, in turn, depends on labor costs, power costs and maintenance charges, any one of which may become the controlling or dominating factor of the entire operating cost. Power costs are easily calculated, but labor costs and maintenance charges are more difficult to estimate and require experience and good judgment. It is the designing engineer's duty to consider such factors carefully and arrive at the true operating economy of the proposed plant.

Consideration of the general elements of design leads to the division of sewage pumping-stations into two general groups,

which, for want of a better classification, may be designated as large stations and small stations. In general, stations handling in excess of 1,000 gallons per minute of sewage or storm water may be classified as large stations. These stations are characterized by large valves and water passages, large equipment and, where screens are necessary, by elaborate mechanism for cleaning screens and disposing of screenings. Trouble from stoppages is rare, because pumping equipment with large clearances and valve passages may easily be provided. Motor-driven centrifugal pumps are very often used, and in many cases stations are equipped with oil- or gas-engine-driven generators to provide emergency power. Excellent examples of large stations are the Calumet, Des Plaines and Evanston stations of the Chicago Sanitary District and the older stations at New Orleans.

Small stations—those pumping sanitary sewage and small quantities of storm water—are much more numerous than large plants, and because they are more often encountered in general design practice and because they offer problems as perplexing and as difficult of solution as the large stations, the detailed discussion is limited to stations of this type.

Determining Capacities

Before any station can be intelligently designed, careful preliminary investigations are necessary. If the station is to be located on an established system, actual gagings of the sewage flowing should, if possible, be made. Studies should be continued long enough to determine the daily maximum flows and the weekly maximums. A careful inspection of the system should be made and the number of roof connections and cellar drains discharging into the lines noted. If the lines are old, there is a possibility of ground water infiltration which may reach considerable proportions in wet weather. Low places where per-

forated manhole covers act as storm-water catch-basins should be investigated and recorded.

An attempt should be made to eliminate all unnecessary infiltration, roof water or storm flow. If this is impossible, pumping equipment must be provided to handle abnormal peak loads. Pumping unnecessary quantities of water only adds to the cost of operation and to the first cost of the station for equipment which is used only a part of the time. Where conditions are such as will permit, storm flows of approximately six times dry-weather flows may be by-passed around the station. This will depend, however, on whether there is a

per capita per day, or 250 to 300 gallons per sewer connection per day. Peak loads may be estimated at 175 to 200 per cent of normal flows.

Selection of Equipment

The capacity of the station having been determined, the next step is the selection of proper equipment. This cannot be done, however, without a clear understanding of the limitations of certain types of equipment when subjected to this kind of service. Very frequently flows as small as 100 to 500 gallons per minute are encountered in the design of these plants. Pumps designed to handle clear water in such small



THE MILLER STREET SEWAGE EJECTOR STATION, FORT MADISON, IOWA

convenient point of discharge below the station and whether the discharge of such flows would be considered a nuisance.

Stations built to serve new districts where sewer-mains and laterals are installed coincident with the construction of the station should be designed to serve the ultimate future needs of the district. Additional equipment can be installed as the district grows. In such a district it is possible practically to eliminate the effect of storm-water periods by seeing that pipe joints are carefully made, that manholes are properly set, and that roof connections are not allowed. Grades of sewer-mains and laterals can be made steep enough to dispense with flush tanks. The normal flow may be estimated approximately 50 gallons

quantities usually have inlet and discharge openings of 2 to 4 inches, while the clearances through the impeller of centrifugal pumps or the valves of a plunger pump are much smaller. Experience indicates that clearances through any device for pumping sewage should not be less than 5, and preferably 6 inches, unless the equipment is protected by screens or trash racks of some sort. Self-cleaning screens are out of the question because of the cost, while small bar or wire screens are always a nuisance from the sanitary standpoint, and very often cannot be tolerated. The attention necessary to care for small bar or wire screens properly is large, and the consequent maintenance costs are abnormally high.

Sewage Ejectors

These limitations of the ordinary types of pumping equipment have led to the development of the pneumatic or air-lift systems using sewage ejectors, as they are commonly known. The sewage ejector is nothing more than a cast iron or sheet steel pot into which the sewage flows through large inlet pipes. When the pot is full, a float-operated valve is opened, admitting air under pressure on top of the sewage, which is thus forced out into the discharge main. Check valves on both the inlet and the outlet sides prevent backflows from the discharge main when the pot is filling and backflow into the inlet line when the pot is discharging. Air for the operation of the ejectors is supplied by means of air compressor units, which may be steam-, electric-motor- or gas-engine-driven. Usually on municipal installations, electric-motor drive is employed with gas-engine or gasoline-motor standby units provided.

Either horizontal or vertical compressors may be used. In the small sizes, air-cooled or hopper-cooled types may be had. For the larger sizes, circulating water must be employed.

Where compressors are electric-motor-driven, several types of motor may be used, operated through remote control apparatus actuated by pressure regulators connected to the air receiver. If the motor is less than 5 h. p., it may be thrown directly across the line by means of a magnetic switch. Where motors are thrown directly on the line, they should either be oversize or capable of exerting a large starting torque or starting effort. Otherwise, an unloader should be used on the compressor, which will allow the motor to come up to speed before receiving its load. For any type motor over 5 h. p., automatic starters, which allow the motors to come up to speed gradually, should be employed. Motors can be connected to compressors either by gearing, silent chain, or belt. Short-belt and idler-pulley drive is usually employed, although some types of chain drive are as flexible as the belt drive and as positive as gearing.

Ejector installations lend themselves to a number of housing schemes. The ejector pots themselves may be placed in underground wells or pits detached and even removed some distance from the compres-

sor stations. It is perhaps best, however, even though more costly, to build the ejector pit inside the station proper. By this arrangement all the machinery is easily accessible and well-protected. It is highly inadvisable to house motor-driven compressor units in underground structures. In severe climates, some method of heating the station should be provided.

From the standpoint of first cost, the ejector type station is at a disadvantage when compared with a pumping-station employing centrifugal pumps and screens. It is difficult to give percentage comparisons, inasmuch as conditions of installations vary somewhat, but it is probably true that the ejector station will cost at least 25 per cent more than the station using centrifugal pumps. The cost of operating the ejector station will, however, in many cases compare very favorably with the pump-station. This is true in spite of the fact that the power costs are higher for the ejectors. The station efficiency of the ejector plant will be in the neighborhood of 25 to 30 per cent, while that of the pump-station will be between 40 and 55 per cent. The cost of an operator must, however, be charged against the pump station, while ejector stations, on the other hand, require very little attention other than the oiling of moving parts occasionally. One man may look after a number of the stations, or where there is only one station it is only necessary to delegate a man from some other city department to make the occasional inspections and oiling necessary. It is because of the fact that the ejector requires little care and attention, coupled with the fact that it possesses excellent sanitary features, that this type of sewage pumping-station has proved itself satisfactory.

Where it is necessary to handle quantities of sewage in excess of 500 gallons per minute, the ejector station, while still capable of the service, is not so well adapted as a centrifugal pump-station, using a centrifugal pump with large clearances through the pump. The vanes should be constructed in such a manner as to take up very little of the circumference of the impeller. There should be no sharp points or edges upon which trash, rags or paper can catch, and the curvature of the ends should tend to oust such rags or trash as might engage the vanes.

The Wood Trash Pump, which is of this type, is claimed to be able to allow the passage of a solid sphere of the next lower standard size than the pump; that is, an 8-inch pump will pass a 6-inch sphere, or anything which will flow around a 6-inch pipe elbow. These pumps are built in either horizontal or vertical types suitable for almost any type of drive. Motors are usually employed, however, and may be either direct current or alternating current. Several methods of control may be provided, but the most popular and the simplest is a float-operated switch actuating an automatic starter. The installation of these pumps is no different from that of any type of clear-water pump running automatically. A closed well should be provided and pumps so set as to remain always primed. No screens are necessary on plants equipped with these pumps in sizes larger than 6-inch, and, consequently, the station may be made entirely automatic, requiring no more attention than is required for the ejector station. The efficiency of the Wood Trash Pump is remarkable, approximating that of the ordi-

nary clear-water pump. In the larger sizes a test efficiency of 76 per cent has been attained. The efficiency curve is flat, which offers an opportunity for a considerable variation in head without a large change in efficiency.

Recapitulation

In recapitulation and conclusion, these points are emphasized: first, the designer of the small sewage pumping-station should be very careful in determining the capacity of the proposed station; second, he should pay special attention to the sanitary features of his plant; third, he should be fully aware of the limitations of ordinary clear-water pumping equipment when employed in this service; fourth, for flows under 500 gallons per minute no class of equipment is as satisfactory as the pneumatic sewage ejector; fifth, for flows of over 500 gallons per minute the Wood Trash Pump offers the best solution of the problem.

ACKNOWLEDGMENT.—From a paper read at the Fifth Annual Sewage Disposal Conference, Iowa State College, Ames, Iowa.

Hamilton Extends its Street-Lighting System

City of 40,000 Began Program Two Years Ago and Appreciates Value of Increased Illumination

ABOUT a year ago, the business men of Third Street, Hamilton, Ohio, organized as the Third Street Boosters' Association, began efforts to obtain improved lighting in their district. They made a canvass of the district and signed up nearly 100 per cent of the property owners, although only 87½ per cent were necessary. The cost of the improvement is about \$10,000 and is assessed on the abutting property.

The new installation is composed of 50 Form 12 Novalux lighting units with medium flashed alabaster rippled glassware installed along Third Street between Dayton and Sycamore



Streets. These units are equipped with 10,000-lumen (1,000-candle-power) Mazda lamps, with an IL transformer with detachable couplings on the primary in the base of each standard. The standards are spaced at intervals of 85 to 90 feet parallel, and the light source is 14½ feet above the sidewalk. A celebration, with addresses, band and orchestral music and dancing, took place when the lights were turned on in this new district.

The improvement in lighting has already brought more people to the street and increased the business of the stores and shops, enabling the merchants to keep pace with the stores on other

streets. As a result, the extension of the white way from Sycamore Street to Central Avenue, the latter being the main thoroughfare from Cincinnati, is contemplated, and legislation is under way for the authorization of a similar lighting installation on Second Street, where a campaign for the improvement has been started.

These successive steps in the improvement of the street lighting of the city began two years ago, when 750 carbon arc lamps, operated at 7.5 amperes, were removed and approximately 1,100 incandescent lamps on brackets were installed. The lamps varied from 250 to 1,000 candle-power. There were also installed about 850 Novalux units equipped with rippled glass globes with dome refractors for 400-

to 1,000-candle-power high-current lamps. The 350 brackets were equipped with reflectors and some with refractors, in which 250-candle-power lamps were used. The old five-light clusters in use were removed and replaced with single-lamp standards with 300-watt multiple cluster units, the multiple system being used because of its economy. This represented a gain in substituting one light for five small and less efficient lamps in this particular class of lighting.

A large share of the credit for the improvement now under way should be given to James O'Toole, City Electrical Superintendent, who has been a constant advocate of, and worker for, better street lighting.

Oiled Earth Roads in Illinois

By James H. Reed

County Superintendent of Highways, Cambridge, Henry County, Ill.

OILED roads are comparatively new in Illinois and may be considered as still in the experimental or trial stage. Some twelve years ago road oil was in use in a number of places on village streets and country roads on a small scale. Great improvements resulted, and the demand for oiled roads increased until in 1923 not less than 40,000,000 gallons of oil was used on some 10,000 miles of roads and streets.

The writer does not regard the oiled road as a substitute for the hard road, but believes our main roads should be paved as rapidly as sound economics permit. Road oiling has attained such proportions and the improvements made thereby have been so great that the process merits careful consideration and investigation as a means of improving secondary roads.

How to Investigate Oiling Methods

The methods at present in use for constructing and maintaining oiled roads should be understood, the results obtained carefully noted, and costs accurately ascertained. The fundamental nature of the oil and the nature of the compounds, mixtures or emulsions formed when oil is applied on the road should be studied, for it would seem that such studies should lead

to a better understanding of the properties, or qualities, to be striven for in the manufacture of road oil and of the best methods of using the product. The effects of different soils and slight climatic differences are to be taken into consideration, and, as far as may be, the limitations and possibilities of the process should be determined.

The usual methods of preparing the road and applying the oil are of common observation. The road is graded as early in the spring as the condition of the ground will permit. It is left open to traffic and is frequently dragged or gone over with some form of maintainer until the oil is applied, the object being to have the road settled and as evenly packed and smooth as possible when the oil is put on. The cross-section of an oiled road is important. A crown of 12 inches in a width of 24 feet has been found satisfactory on a road with considerable traffic.

Applying Oil

In Illinois, road oil is usually heated and applied with pressure oilers mounted on motor trucks, though light oils are sometimes successfully applied without heating. The most common form of distributing truck, or spreader, is that in which a ro-

tary pump forces the oil onto the road through spray nozzles. In this way, the oil is applied very uniformly. On country roads, different quantities of oil are used, 2,500 to 4,000 gallons per mile and $\frac{1}{2}$ -to $\frac{3}{4}$ -gallon per square yard being common figures, with a tendency toward the use of more oil. The cost varies with the price of oil and the distance hauled, but in 1923 was often $6\frac{1}{2}$ to 7 cents per gallon, including oil, freight and spreading. Maintenance is carried on, or attempted, with road drags, blade maintainers and similar apparatus.

The greater part of the road oil used in

ditions frequently contain such notes as: "Unoiled roads very muddy; oiled roads good; 90 per cent main roads oiled." "State Aid oiled earth roads in good condition, despite rains of last few days." "These three are oiled and in good shape at all times."

In the spring, oiled roads sometimes fail, and oiling will not cure "seep holes" which occasionally appear at that time on account of water in the subgrade. On the other hand, some counties report that oiled roads have carried a very considerable traffic uninterruptedly and satisfactorily throughout the entire year.



THE OILED EXPERIMENTAL ROAD IN HENRY COUNTY, ILL., IMMEDIATELY AFTER A SIX-DAY RAIN, SHOWING EXCELLENT CONDITION OF SURFACE

Illinois is applied on the earth roads of the central part of the state, little being used in those northern counties where gravel or rock is available for road building, and little going south of the black-soil belt. Within central Illinois great improvement in roads has resulted from the use of oil, although the degree of success attained has not always been everywhere the same.

Oiling a Great Improvement

The oiled roads are at nearly all times better than the unoiled. Except where the soil is light and except during long periods of hot, dry weather, the dust is kept down. Summer rains have little detrimental effect on an oiled road, and in the fall, when rains are frequent and evaporation is slow, the difference is often such that reports issued by automobile clubs on road con-

As pointing toward the limitations of oiling, it seems that oil does not increase the bearing power of the road above that of the compacted unoiled soil, nor does it form a mat, or oiled crust, or layer of earth mixed with oil, of sufficient strength, as a slab, to distribute wheel loads over any considerable area. At present, its possibilities seem to be those which would follow the formation of a surface which will not become dusty and which will shed water.

Studies of Oiling

As to what is being done in a study of the process, outside of the actual oiling of roads undertaken by many townships and counties, it may be said that the University of Illinois, the Illinois Division of Highways, certain of the counties and many of the large oil producers and refiners are

devoting a great deal of time and study to the subject, both in the laboratory and in the field.

Three experimental roads have been oiled, one at Urbana, by the University, under the charge of Professor W. M. Wilson; one near Rosemond, conducted by the State Division of Highways and Christian County jointly, and one near Cambridge, conducted by the state and Henry County. F. L. Sperry, Assistant Engineer of Materials of the Division of Highways, has been in immediate charge of the two last-named roads for the state. A number of the large oil companies have cooperated earnestly in this work, donating oil in some instances and assisting in every way possible through their engineers and chemists.

A brief description of the experimental road in Henry County will indicate the scope of the work undertaken. The road chosen for the experiment is typical of the most heavily traveled country roads of that part of the state, and throughout its length the soil is quite uniform. It is divided into 15 sections, each 1,000 feet long, and each section is oiled with a different kind or quantity of oil. On some sections, the total quantity was all applied the same day, and on others the same total quantity was used, but was applied at two or three different times during the season.

The road oils available here are usually residuums resulting from the distillation of crude petroleum. In some instances, a heavy residuum is "cut back" with a lighter oil, and sometimes different residuums are blended. By different kinds of oil is meant distinct types, distinguished by the source, or field, supplying the crude oil from which

the road oil is made, or by the process of refining, and all the various types supplied commercially in Illinois have been used in these experiments.

The experiments in Henry County have been in progress during the last six months only, and it is felt that definite conclusions as to the best kinds of oil for the purpose and the best methods of construction should not be drawn from these experiments before the road has at least gone through the trying conditions of spring, especially as the comparative condition of the several sections changes rapidly and continually. However, many interesting, and sometimes unsuspected, facts have been observed which appear to be factors in the success of an oiled road, and certain things seem fairly well established: for instance, it seems likely that $\frac{3}{4}$ of a gallon per square yard is the minimum that can be depended on through the year, and much better results have been obtained when the entire quantity was not applied all in the spring, but part was reserved until late in the summer.

It is planned to continue the experimental roads in 1924, with the work of the University, the Division of Highways and the counties concerned carefully coordinated. And it is the hope of those connected with the work that information will be obtained which, added to the experience accumulating in oiling, will lead to a determination of the proper field for this method of road improvement and to the economical construction, within that field, of good and dependable oiled roads.

ACKNOWLEDGMENT.—From a paper read before the Illinois Society of Engineers.

May Day for Child Health

THAT May Day may become generally accepted as the day of auditing the child health situation in American communities is the hope of the American Child Health Association in fostering the idea of making May 1 Child Health Day.

Although infant mortality in the United States has been reduced by half during the last twenty years, the fact that we are sixth among the nations of the world in childhood deaths shows that much remains to be done. That this country is seventeenth as to losses of mothers in childbirth is nothing short of a national scandal.

The situation demands fuller support of pub-

lic health officers and the recommendations of other capable medical and sanitary advisors in the matters of nutrition, housing, nursing, ventilation, clothing, exercise, rest and the other elements which make the total well-being of the individual. To bring about this support, an awakened public conscience is necessary. So May Day will be made an occasion to emphasize that child health is not a matter for the professionals alone, but that it is the concern of every citizen. Organizations desiring to cooperate in carrying out this plan can obtain helpful suggestions from the American Child Health Association, at 370 Seventh Avenue, New York.

How Should Hydrant Rentals be Charged in a Municipal Plant?

By W. C. Brockway

Taxpayers' League of St. Louis County, Inc., Duluth, Minn.

THE state constitution of Minnesota, according to Article IX, exempts from taxation "public property used exclusively for any public purpose." The courts have construed this to include city-owned public utilities. Further, the consensus of public utility rulings considers the municipal water department as a separate entity, distinct from other functions of government and required to finance its own operations, according to a statement of Caleb M. Saville, Manager and Chief Engineer, Board of Water Commissioners, Hartford, Conn.

Who Pays for Fire Protection?

The payment of fire protection service involves two issues:

1. Shall the burden be placed on consumers by including the cost of this service in the water-rates?

2. Shall property be charged in proportion to the value of the fire protection received?

Quoting Caleb M. Saville further:

"While the actual increase would be small if the cost of fire protection were placed on consumers, because of being so widely distributed, yet its imposition has by public utility commissions been held unfair, inequitable and discriminatory. The fallacy and inequality of putting the cost of fire protection on private consumers is evident when it is considered that oftentimes high-value buildings use so little water that their contribution to the cost of fire protection based on rate payments would be negligible compared with the amounts paid by low-value buildings using large quantities of water. The most equitable method for defraying the cost of fire protection benefit is its inclusion in the general tax laid against prop-

erty." (*Engineering News-Record*, May 17 1923.)

When fire protection is paid for out of the water rents, tenants pay for the fire protection of the landlord, who may not pay for any water service whatever. Amounts paid for fire protection service never amount to more than a small fraction of the value of such service to the community, nor is it contended that they should. Equity does demand, however, that the property protected by fire-hydrants should pay the full cost of rendering such protection.

When water consumers pay the cost of fire protection service in the water-rates, it is found that some industries pay several hundred per cent more for the fire protection service rendered by the water department per thousand dollars of assessed valuation than any other groups of property owners. In

Duluth, laundries pay in water-rates approximately \$39 per \$1,000 of assessed valuation, whereas the wholesale houses pay only \$1.88.

RELATION BETWEEN WATER RENTS AND PROPERTY VALUES, DULUTH, MINN., 1922

Classification	Assessed Valuation of Property	Amount Paid for Water	Amount Paid for Water Per \$1,000 Assessed Valuation
Laundries	\$95,400	\$3,751.08	\$39.40
Manufacturing plants	990,900	6,986.27	7.05
Apartments, hotels..	181,100	2,593.19	14.30
Department stores...	999,700	1,782.62	1.78
Office buildings....	621,400	3,867.08	6.22
Wholesale houses....	2,596,500	4,838.90	1.86
Private houses.....	111,100	196.90	1.77
Grand totals and average	5,596,100	24,016.04	4.30

The Fundamental Principles Involved

The fundamental principles involved in this discussion are the status of water departments as to payment for services rendered, and the question of taxation. There is also the question of equity, as to whether consumers shall bear the burden by reason of increased water-rates, or whether property shall be assessed in proportion to the value received. The first point which must be considered is fire insurance rates and water-supply, as regards the value of fire protection in dollars and cents.

If fire protection costs were paid from the general tax fund, property would pay in proportion to its assessed valuation for value received. If the city paid the water department for fire protection services, the money would come from general taxation, so that each property owner would pay a part of this charge in proportion to the assessed valuation of his property. On the other hand, if the city does not pay for this charge, it must be paid for out of the water rentals, in which case the industry using the largest amount of water will pay the largest portion of the fire protection cost, irrespective of the valuation of the property of the large users.

If water rents absorb the fire protection charge, the basis for payment is the amount of water used, and not assessed valuation. As to fire protection service, the actual service rendered to the individual certainly depends upon the value of his property and not upon the amount of water he consumes.

Fire Insurance Rates and Water-Supply

Basic rates for fire insurance depend upon the water-supply, fire department, streets, police department, general weather conditions, and building code. The individual risk depends upon construction, occupancy, hazards, exposure, fire protection devices, and the general tone of management. A better alternative than water for fire protection on a large scale does not exist. Water is necessary for fire protection to such an extent that it requires no comment.

According to George W. Booth, Chief Engineer of the National Board of Fire Underwriters, "the relative classification of cities is graded on a scheme in which

there is a total of 5,000 points of deficiency between a place having the best of protection and one without any."

These deficiencies are made up as follows:

Water-supply	1,700	34%
Fire department	1,500	30 "
Fire alarm	550	11 "
Police	50	1 "
Building laws and their enforcement.	200	4 "
Laws in regard to hazards and their enforcement	300	6 "
Actual structural conditions in the mercantile district	700	14 "
	5,000	100 "

Determination of Charges for Fire Protection Service

A composite charge consisting of a unit charge per hydrant for maintenance and depreciation plus another unit charge for pipe capacity and other costs incident to fire protection, seems to be the method most favored by public utility commissions in determining the proper charges for fire protection service by water-works.

Fire-hydrant rentals do not represent generally the cost of rendering fire protection service. When the cost is placed on this basis, there may be a tendency to discourage the installation of the proper number of hydrants in order to keep down the fire protection charge. In the case of city-owned plants, the fire protection revenue is rarely commensurate with the cost of service. This revenue should lie somewhere between the cost of the fire protection plant and the value of the service to the city. No constant economic relation exists between hydrant rentals in the narrow sense and taxation, so it is unsound to let one item balance the other.

Maintaining Pavement Between Street Railway Tracks in Hartford, Conn.

IN accordance with an act of the Connecticut Legislature of 1921, the work of maintaining the pavement of the area in and between the tracks and 2 feet outside the outer rail, cuts made for repairs to rails excluded, formerly assumed by The Connecticut Company, the local street railway utility, now devolves upon the city. Of the former railroad area described above, the Connecticut Company is now compelled by law to pay for repairs only in the area bounded by lines 8 inches outside of the outer edge of each rail, or a strip approximately

22 inches wide along each rail.

An accurate record was kept of repairs in these strips and the costs billed monthly by the Hartford Street Department to the Connecticut Company. The total of these bills was \$4,853.92, covering 2,065.5 square yards of asphalt. As a matter of record, detailed accounts were kept of repairs in the area formerly paid for by the Connecticut Company, but for which the city must now pay. It is interesting to note that this total was 2,032.47 square yards, costing \$4,776.30.

New Subdividing Methods on an Indiana Town Site

IN a booklet on the new town site of Woodmar in Hammond, Ind., Roscoe E. Woods, President and Director of the project, makes this statement to his colleagues:

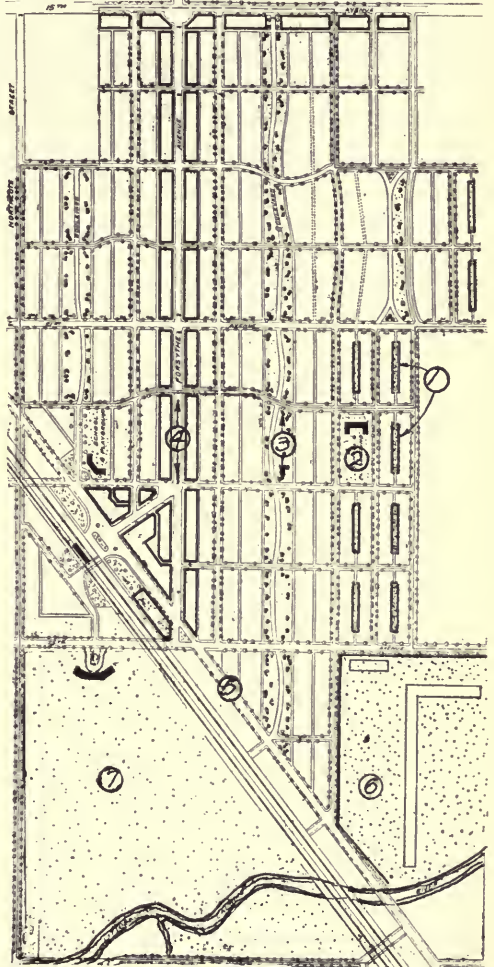
"Cities are not built for a day nor for a lifetime, but to last until the end of time. The buildings may fall into decay, but the streets remain for the most part unchanged. The mark of your handiwork as a builder will be indelible. Time and changed conditions may slightly alter what you do; but the impress of your plans will still be unmistakable. The streets which you now dedicate to public use will soon be astir with a thousand activities, and the foresight which you display in planning them will add to the serenity of life, and detract from the confusion of this urban existence. A town site is a setting in which life's dramas are enacted. In planning this city you are doing something of which you, your children, and your children's children may be proud. No matter what the pecuniary reward may be, it will not compare in satisfaction with that you will receive in the knowledge that you have built this city as well as you knew how."

This is the point of view which appears to have controlled the planning of this new town, which covers an area of nearly 600 acres and will support a population of over 10,000 people.

The plan includes an eighteen-hole golf course with the club-house looking down from a terrace over a broad, wedge-shaped field on which the course is laid out, utilizing the Little Calumet River for a number of water hazards and also for a closure to frame the view. For schools and school playgrounds two entire blocks conveniently located are set aside. The street system is laid out to provide for large increase in automobile traffic and for automobile parking space, and the streets are being developed progressively. These features are interesting and valuable, but not new.

The fact that Woodmar straddles a main radial thoroughfare running south from the great Calumet steel district and that consequently the flow of traffic will be largely due north and south, and east and west, dictated a system of streets on the rectangular plan. The existing main highways confirmed this type of plan and, in fact, made it impossible to vary greatly from the

rectangular system, even if that had been desirable. One diagonal thoroughfare following the railroad is provided for motor truck and motor bus transportation along that particular line.



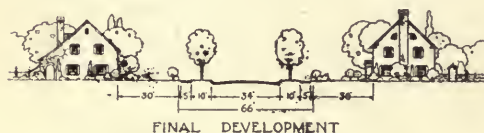
THE TOWN SITE OF WOODMAR, IND.

1. Playgrounds within residential blocks, where the little children can play safely. These playgrounds are 50 feet wide and 400 feet long. 2. Each school and school playground occupy one entire block. 3. Parkway and boulevard through the entire length of the town. 4. Business street. Business activity is confined to this street (108 feet wide), the north border street, and the frontage across from the railway station. 5. Motor bus and motor truck thoroughfare to and from Chicago. 6. Aeroplane landing field. 7. Golf course (Woodmar Golf Club).

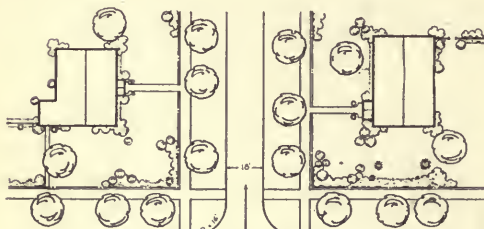
For this plan and those on the next page, THE AMERICAN CITY is indebted to Jacob L. Crane, Jr., of Chicago, engineer of the project.



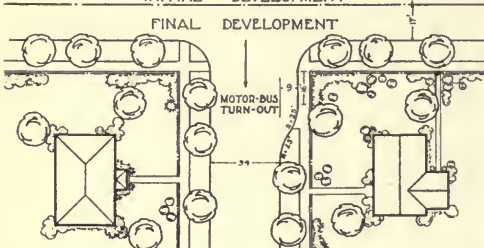
INITIAL DEVELOPMENT



FINAL DEVELOPMENT



INITIAL DEVELOPMENT



FINAL DEVELOPMENT

PLAN OF TYPICAL RESIDENTIAL STREET IN WOODMAR, SHOWING MOTOR BUS TURNOUT AND PROGRESSIVE STREET DEVELOPMENT

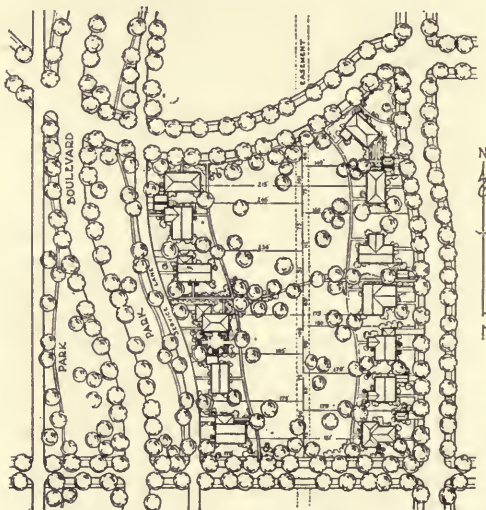
While the general plan does not seem unusual, a number of new features will add interest and attractiveness to the development. First, there are two drives extending through the entire project. The parkways along these drives vary from 150 to 350 feet in width. Every opportunity is taken to vary the direction of a street enough to close the view and to give some interest and charm to the arrangement.

Playgrounds located within residential blocks are proposed in nine instances. The illustrations show the arrangement of these interior playgrounds. They are 50 feet wide and 400 feet long over-all, and it is proposed to divide each one into two sections, one

enclosed with a fence and planted with shrubbery and trees, to be used by the mothers and little tots, and the other to be left open as a boys' playground.

Five blocks are so arranged that the houses can face inward on a small private interior park. This arrangement frankly considers that nowadays the street has become a service way more or less dangerous and noisy, from which fact it is argued that the service side of a house should face the street and the front should face an interior park.

Motor bus landing places and also motor bus terminals are definitely proposed in the plan. The turnouts for landing places are shown in one of the illustrations as a further consideration of contemporary tendencies in transportation. And an aeroplane landing field has been located on a tract of flat



PLAN OF BLOCK IN WOODMAR, SHOWING SUGGESTED INTERIOR PARK ARRANGEMENT

ground fairly convenient to the other centers of transportation for purposes of interchange.

The whole tract has been zoned, and each piece of property will be sold under definite restrictions regarding the use, setback, yards, height of buildings and cost of buildings.

LONG-DISTANCE THINKING

The great lesson we can learn from European cities is the wisdom of thinking in terms of generations, rather than in terms of months and years in the planning of a city. Almost every civic undertaking of consequence takes many years in accomplishment.

—J. C. NICHOLS.

Modern Street Lighting

By C. F. Lambert

Burns & McDonnell Engineering Co., Kansas City, Mo.

THERE are, generally speaking, two methods of street illumination: first, the high-intensity lighting found in business sections of cities which require an illumination sufficient to enable a large and fast-moving volume of traffic to be handled without accident; second, low-intensity and uneven lighting, as found in residence sections where objects, vehicles, etc., are seen in silhouette, usually as dark outlines against an illuminated street surface. As these streets are frequently lined with trees, it is necessary to place lights low to avoid the foliage. Therefore, residence streets are generally lighted to better advantage with low-power lights at fairly close intervals than by high-power lamps at street intersections only. Generally, about three-fourths of the total length of streets in a city falls within this class. The still further outlying districts require merely a line of lights to indicate the way for travelers, and no effort is made for direct illumination.

The many factors entering into the problem of street lighting require many compromises in attaining the final result. The desirability of a uniform design throughout a city should not be overlooked, especially in the lighting of a long thoroughfare which may extend from a business center to the outskirts. In such a case it may be necessary to sacrifice the requirements of certain sections, to some extent, to produce the proper effect for the whole.

Local conditions govern, to a large extent, the requirements for laying out a street-lighting installation, and no definite rules can be made covering all cases. The amount of distribution of the light, the size of unit to be employed, and the height and spacing of the lamps are all correlated



SUPER WHITE WAY FOR BUSINESS SECTION

and must be considered with other factors. Where there is no foliage, lamps should be placed well above the ground, so that the maximum illumination may be obtained at distant points. Care must be exercised, however, that the lamps are not mounted too high, as the uniformity would be gained at a sacrifice of intensity. The limiting factor for height and spacing is the amount of light obtained midway between the light sources.

When pendant or hanger types of units are used along the curb, lamps up to 100 candle-power should be mounted from 15 to 18 feet high, depending somewhat on the light distribution. The higher candle-power sizes, that is, 400, 600 and 1,000 candle-power, should be suspended at a height of from 20 to 25 feet. The spacing depends upon the uniformity of the illumination desired, and should seldom be greater than ten times the mounting height.

For wide streets, lamps placed opposite one another will present the neatest appearance. The staggered arrangement of lamps is sometimes advantageous in giving a uniform illumination, but will not be so attractive in appearance as lamps placed directly opposite each other. The arrangement of poles on one side of a narrow street is often very effective and economi-

cal, and is especially applicable to the lighting of parkways and suburban or residence streets. This arrangement is not suitable, however, for commercial streets.

In the low-intensity lighting it is important that lamps be located at all street intersections; but with ornamental post systems, it is not desirable to place lamps directly on the corner, as the glare from such a lamp will tend to blind the driver who is about to turn the corner and wishes to see if the way be clear. Care should be taken in any street lighting that the lamps appear in a continuous line, as any irregular placing of lights will detract greatly from the effect.

Proper Diffusion Essential

No definite figures have been generally accepted for determining the intensities of illumination most desired, and methods of comparing intensities of illumination of different types of light have not been standardized. The final determination of intensity for street lighting depends upon the cost and many other factors, such as the surroundings and other local conditions. Comparisons of practice in various sections and cities are useful in this connection. For similar units, such comparisons may be made in watts per running foot of street; otherwise, illumination or candle-power value of the same order may be utilized.

The proper diffusion of light by means of diffusing globes and refractors is important in reducing the glare from bright light sources coming directly in the range of vision, and also eliminates the deep shadows. This is becoming of greater importance every day, because of the increasing brilliancy of modern illumination. The appearance of a light source is also great-

ly improved by the use of such equipment.

There are many different types of street lighting, including both high and low candle-power pendant units, suspended from brackets or span wires, and ornamental post lighting with lamps of both high and low candle-power. The system of energy supply to the lamps may be either multiple or series. Both systems can be installed underground or overhead. Of course, the greatest number of systems in this country are operated on the overhead series system.

The cost of installation and operation of street-lighting systems is governed entirely by local conditions, and one is quite liable to be led to wrong conclusions if comparison is made of the prices charged in different cities, without a full knowledge of the local situation.

Sizes of series lamps available for street lighting vary from 32 candle-power to 1,000 candle-power for use on a 6.6- to 7.5-ampere alternating-current circuit. As the lamps of high candle-power can be operated more economically at high currents, the units for the larger lamps are usually equipped with compensators or transformers. This permits their use in series with the smaller lamps.

Much skill has been shown in lighting of roads and highways. These are now being lighted by equipment which collects the rays and throws them up and down the road where needed. These units are mounted 30 to 35 feet above the road, and the glare which might naturally be expected to result is not apparent. The illumination of 250-candle-power units is excellent when placed 300 feet apart, and the lighting is good at even twice that distance. At the intersections of highways,

high-powered flood-lighting projectors are sometimes installed. They must be installed so that no glare reaches the motorists.

For outlying residence districts, 40- to 100-candle-power lamps are popular, and their height and spacing are adjusted to meet the conditions. For the main residential section, the lighting should be



RESIDENCE STREET LIGHTING

somewhat increased, and lamps of 100- to 400-candle-power are utilized. A general plane of illumination comparable with that of bright moonlight and ranging from 1/20-foot-candle to half or third of that amount is usually sufficient.

Summer resorts and cities having a high seasonal percentage of transient population require a highly ornamental type of residential street-lighting fixture. This can be arranged so that a distinctive ornamental system may be had four months in the year and an adequate and economical system the rest of the time.

In the main business section, the art of street lighting has been most fully developed. Here the plane of illumination should be carried near to 1/10-foot-candle, ranging perhaps from half of this amount at the darkest spots to at least double near the lamp. The most important streets and public places ought to have an average of a good 1/4-foot-candle, giving light enough to read a note-book. Such lighting ought to be furnished in places out-of-doors where the public gather at night, and in streets where the traffic is dense or the requirements for policing exceptionally severe.

In order to obtain the greatest usefulness and the most brilliant results along a business street, most of the lights should be cut off from vainly trying to illuminate the sky. The buildings along the street should be well lighted from the street lamps, and the street surface should be sufficiently illuminated to permit traffic to see clearly. Powerful arcs or large incandes-



PARK LIGHTING

cent lamps placed fairly high, 18 to 20 feet, and spaced at a distance not over four or five times their height are very effective in securing these results.

In selecting the design of a standard for street lighting, local features and historic tradition can often be utilized. For instance, Los Angeles, Calif., has adopted a style suggesting the Spanish Renaissance. Riverside, Calif., has accentuated the mission features of her spirit by installing a rough concrete post in the form of a chapel bell tower with three mission bells hung in a triangle, and a cross at the top of the design. The requirements of cities which are far from the source of supply of standard globes can be met with the lantern type of unit.

Thus, in modern street lighting the work of the architect and artist keeps pace with that of the electrical and illuminating engineer, so that every city may acquire a lighting system which will be adequate for the illumination required, and will be the joy and pride of the entire community.

ACKNOWLEDGMENT.—From a paper read before the Indiana League of Municipalities.

Oakland County, Mich., to Duplicate Ideal Section of Lincoln Highway

OAKLAND COUNTY, Mich., is going to provide a road between Pontiac and Detroit, Mich., which in many respects will be two Lincoln Highway Ideal Sections side by side. This 32-mile road, to be constructed by the state and the county, will have a right of way of 200 feet and will consist of two 40-foot concrete pavements, separated by a 44-foot space, in which the interurban line will

run. High curbs will separate the interurban tracks from the two automobile highways, each of which will carry one-way traffic. Outside of each 40-foot pavement will be a gravel shoulder 38 feet wide. These shoulders, roads in themselves, will be provided for the use of slow-moving vehicles and for parking purposes; thus 78 feet of width will be provided for travel in each direction.

An Outline of the Causes of Waves in Asphalt Pavements

By Prevost Hubbard

Chemical Engineer, The Asphalt Association

WAVINESS is not an inherent characteristic of asphalt pavements, as evidenced by millions of square yards of satisfactory surfaces varying from one to forty years or more in age and subjected to all conceivable conditions of exposure and traffic. The formation of waves, particularly in pavements of the fine aggregate type, does, however, occur to a sufficient extent to warrant a thorough investigation of the subject, with the idea of securing data that will enable highway engineers to prevent such defects in future construction. Such an investigation has recently been undertaken by the U. S. Bureau of Public Roads in cooperation with the Asphalt Association and the cities of New York, Philadelphia, Baltimore, Washington and Detroit.

Traffic is, of course, the most direct cause of wave formation, the thrust of vehicle wheels tending to rearrange the mineral particles of the paving mixture from the surface down. Under certain conditions, the mixture is, therefore, shoved into humps or waves, usually at a right angle to the direction of traffic, although at curves and intersections waves due to the side-thrust of vehicles are sometimes noted. When the pavement is sufficiently wide to allow two well-defined lines of traffic, transverse waves are most prevalent near the gutter, where most of the horse-drawn and other slow-moving vehicles travel. Even on comparatively narrow pavements waves seldom extend entirely across the surface. While it is probably true that the impact of fast-moving traffic accelerates wave formation, once started, or may be directly responsible where irregularities in contour first exist, slow-moving heavily loaded vehicles are believed to be the chief cause.

There are a number of conditions that tend to promote wave formation which are being given careful consideration in the government investigation. These are as follows:

Foundation Faults

Lack of support from below, causing local settlement of the foundation

Uneven contour in formation, causing variable thickness of asphalt paving mixture and consequent differences in compression

Very smooth foundation, which may promote slipping of the asphalt paving mixture over its surface

Inferior Paving Mixture

Use of too soft an asphalt cement for the climate, the traffic, or the grading of the mineral aggregate

Use of too much asphalt cement in the paving mixture

Poor grading of mineral aggregate, which creates instability of the paving mixture irrespective of the consistency and percentage of asphalt cement with which it is mixed.

Use of an excess of rounded particles of mineral aggregate in the paving mixture

Construction Faults

Uneven contour due to faulty spreading, raking or rolling of the paving mixture during construction, or to lack of uniformity in the composition of the paving mixture

Lack of proper initial compression during construction, which may be due to use of too light a roller, too little rolling, to the mixture's being too cold when rolled, or too great thickness of course for a single rolling operation

Faulty repairs to service openings

Exterior Causes

Absorption of an excess of oil or gasoline drippings, causing undue softening of the asphalt cement

Gas leaks from mains below the pavement structure, causing undue softening of the asphalt cement

ACKNOWLEDGMENT.—From a report presented at the International Road Congress, Seville, Spain.

Forward Steps in City and County

How a Little Town Is Securing a Community Playground

KINGSTON, MASS.—A remarkable piece of community work, in the form of a playground movement, was started last year in Kingston. This small New England town, situated on the main highway from Boston to the summer resorts of Cape Cod, has, like other country towns, suffered in recent years from the increasingly heavy automobile traffic during the summer months. It has consequently felt the great need for a safe play place for the children of the community. But the local tax rate had reached its limit, and no town funds were available for the establishment of a playground.

The question was finally discussed at a meeting of the Kingston Board of Trade, and a committee was appointed to look into the matter. This committee, seeking to arouse the interest of the people in general, called for a representative of each local organization to join in forming a Playground Association. A suitable site, com-

prising nine acres in the center of the town, was selected, a survey made and plans distributed among the citizens. Contributions were then pledged for the purchase of the property and the establishment of a playground fund. The next steps were the appointment of a Park Commission by the Selectmen and the subsequent hiring by the Commission of a superintendent and a small gang of men to carry on the work.

On April 27 of last year the first sod was turned by one of the Selectmen and work began in a small way with wheelbarrows and shovels. A shallow, marshy pond of two acres had to be filled and the filling taken from the surrounding land. When the project is completed there will be about six acres of graded land at the base of a slope forty feet high extending along one side of the field. This slope will furnish ideal seating space for games in summer time, and toboggan slides, coasts and ski jumps in winter. Two baseball diamonds, a running track, a football field and two tennis courts are included in the plans, and



OXEN AND TRACTORS, MEN AND BOYS, WORKED TOGETHER IN GRADING KINGSTON'S COMMUNITY PLAYGROUND

a part of the field will be flooded for skating in the winter.

As the work progressed, interest in the project increased, and some people loaned teams and tractors to assist in the job. During the long summer evenings it was not an uncommon sight to see a hundred men and boys, from all walks of life, working side by side on this community task. A Volunteer Day was called for June 16, and over 300 responded. It was indeed interesting to see the double and single horse teams, yokes of oxen, and men with wheelbarrows, competing with the modern tractors. The women of the town did their part by serving a luncheon at noon and refreshments during the afternoon to the workers. In August a town fair was held on the grounds, and this added over \$1,500 to the fund.

Work ceased for the winter on November 26, with the job about two-thirds completed, and will be resumed this spring. The Commission hopes to have the grading finished before the second annual town fair next August.

Wayne County Plants Many Trees

WAYNE COUNTY, MICH.—The past year was the most successful tree-planting season the Wayne County (Michigan) Road Commissioners have had. Particularly adapted to tree planting, the season gave the Commission an opportunity to complete its entire program for the year.

Two thousand select trees, 2½ to 3 inches caliper and from 12 to 20 feet in height, have been planted. These are mostly American elms and sugar maples, with a few Norway maples. The latter were planted through the village of Plymouth on the Canton Center road; the other types on Warren Road.

To date there are approximately 60 miles of improved roads planted to trees. These trees are placed 32 feet from the road center, which allows ample room for future pavement widening. The distance between the trees varies from 60 to 80 feet, depending on varieties planted.

In some localities, as on Telegraph Road, informal planting has been carried out. This system of planting, which is simply the spacing of trees irregularly, has been followed on roads passing through rather rolling country and is practiced to break

up the monotony of a continuous row of trees uniformly planted.

All fences are being moved back to the property line, which in most cases is 33 feet from the center of the road, giving room to plant and care for the trees. After the trees have been properly pruned and planted, they receive efficient maintenance of watering, cultivating and mulching until they become well established. Spraying in season is also practiced, so that the trees are kept free from injurious insects at all times.

To date there have been planted approximately 8,000 trees. With this number of trees planted, the loss has amounted to about 7 per cent. All dead trees are immediately replaced at the next planting season. The proposed planting for 1924 includes about 20 additional miles, using some 2,500 trees. Besides the trees planted on the roads, about 1,200 have been planted in the county parks and along the roads adjacent to the parks. Approximately 6,000 shrubs have also been set out in the parks. These consist of about 50 species, mostly of native varieties, and were used for screens, building supports and general landscape effects.

As the parks are developed, more shrubs and trees will be necessary to complete the proper landscape. Trees must be planted each year to replace the old ones which die out.

LEROY C. SMITH,
Engineer-Manager, Board of Road Commissioners.

Model Home Provides Convention Fund

ENID, OKLA.—A novel plan of raising a convention entertainment fund, and at the same time encouraging the building of better homes, has been successfully worked out by the Enid Realty Board. When it was decided over a year ago that the 1923 convention of the Oklahoma State Association of Real Estate Boards would be held in Enid, the local realtors evolved the plan of building a model home to be used, first of all, for demonstration purposes and then sold, the proceeds to defray the convention entertainment expenses. A building committee of the Realty Board was appointed and plans for the house were promptly drawn up. The members of the Board each donated \$50 to enable work on the building to be started, and an appeal for cooperation was sent out to local firms and

labor unions. The splendid response to this call for help was beyond expectation, and gave evidence of the fine spirit of good citizenship existing in the community. All the materials used in the construction of the home were furnished at less than cost price by the various business houses, and members of the local labor unions each donated a day's work toward the erection of the house.

The model home is a six-room brick-veneer bungalow, built and furnished along the most modern and attractive lines. When completed, it was opened to the public for 30 days, and it is estimated that about 10,000 visitors inspected the building and its furnishings. The home was also visited by those attending the state convention of real estate boards and the Enid realtors were highly commended on the perfection of the building in every detail.

E. M. DEMPSEY, Acting President,
Enid Realty Board.

Labor-Saving Methods Adopted by Cook County Commissioners

CHICAGO, ILL.—Rearrangement of the departmental organization, installation of labor-saving equipment, and changes in methods of conducting certain activities, are outstanding measures already undertaken in Cook County following the recent efficiency and economy survey. Major accomplishments already effected in the use of labor-saving equipment include:

A reduction in extra and overtime salary expenditures from \$965,000 in 1922 and \$1,122,000 in 1923 to an appropriation of \$532,000 for 1924, by doing away with long-hand writing extensive records in the four tax departments, this being made possible by the installation of labor-saving equipments costing approximately \$225,000.

Installation of a uniform timekeeping and central pay-roll addressograph system for all county departments and institutions.

Provision for the installation of photographic equipment for making permanent records of instruments filed in the Recorder's office, resulting in improved services and estimated salary savings of approximately \$200,000 each year hereafter.

Installation of photographic and dictating equipment for writing permanent and certified



THE MODEL HOME IN ENID, OKLA.

records in the offices of the Clerks of the Courts, resulting in improved services and future salary savings estimated at \$60,000 per annum.

Installation and use of bookkeeping and billing machines in the Comptroller's Office, providing for improved, up-to-date accounting and financial records.

Installation of mail sealing and canceling machine and provision for central despatching of county outgoing mail.

Funds for further improvement in organization and methods, and for the enlargement and extension of county services, are provided in the 1924 budget.

J. L. JACOBS.

Sanitary Sewer for Small City Financed by Short-Term Improvement Bonds

MT. PLEASANT, MICH.—The practice of financing municipal improvements by the issuance of short-term bonds has been adopted by the city of Mt. Pleasant, and so far the method has proved to be a very satisfactory and economical one.

A typical example of what has been accomplished in this way may be seen in the installation of a sanitary sewer undertaken during the summer of last year. The cost of this particular improvement, estimated at \$5,000, was levied against the properties benefited, the assessment to be paid in five yearly installments of \$1,000 each. The first payment came due on June 1, 1923. The city therefore required an additional \$4,000 to completely cover the cost of the work to be done. To provide for this, four bond issues in the sum of \$1,000 each, maturing respectively in one, two, three and four years, were floated. To make the investment an attractive one, an interest rate of six per cent was offered, and the bonds were sold by the City Clerk within a short time.

If when such short-term bonds are issued there happens to be a surplus in any of the city's several funds, such as the sinking fund or saving fund, the city itself purchases some of the bonds, and in this way a saving is of course effected.

If the cost of the improvement is less than the estimate, the balance of the money on hand is used in calling in some of these bonds and the property owner to whom the improvement is assessed is given credit on his last installment for the amount saved.

CARL H. PETERSON,
City Manager.

Helping a Community to Get Acquainted with Itself

MOBERLY, Mo.—Believing that a large majority of the citizens of Moberly were but slightly acquainted with their home town, especially as to its resources and industrial possibilities, Mayor Rolla Rothwell recently gave a municipal banquet, and took advantage of that opportunity to present to the gathering some interesting facts about the city. More than 250 representative business men and employees were present on the evening of the banquet, and after the dinner the Mayor addressed the group. He included in his talk figures and data showing the present standing of the various industries of the city, gave the pay-rolls of these concerns, and made every effort to impress his audience with the fact that Moberly was in a flourishing condition and that the future was bright. A member of a local abstract company then made an address in which he quoted figures showing the increase in property values in the city during the last few years.

Shortly after the municipal banquet, the *Moberly Monitor Index* published a "Trade Edition," with the intent of carrying still farther the Mayor's idea of acquainting the citizens with their community. In this issue reviews of all the industries of the town were published, each one showing a steady increase in business over the previous year, the facts and figures having been compiled from answers to a questionnaire sent out by the newspaper to the business houses and

professional men of the city. The *Monitor Index* also published interviews with about 200 local business and professional men under the headings "What Does Moberly Need Most?" and "What Is the Business Outlook?"

As a result of the Mayor's banquet and the newspaper's trade review, there have been evidences of a revival of enthusiasm and community pride among the townspeople, and the business men have acquired a more optimistic outlook on the future.

GORDON HUDELSON,
Moberly Monitor Index.

A Village Votes One-Sixth of Its Assessed Valuation for a New School

LOWVILLE, N. Y.—This village of 4,000 population, with an assessed valuation of slightly over three million dollars, has voted a bond issue of half a million dollars for the construction of a new elementary and academic school, and an additional appropriation of \$4,500 for the purchase of the necessary additional land.

The present Lowville Academy, an historical educational institution founded in 1805, has for many years been inadequate for the needs of the community. It was originally a private school, and although about twenty years ago it became a part of the union free school district, the property has, up to the present time, been under the control of a separate board of trustees. By a special act of the Legislature, supplemented by a Supreme Court order, the trustees were recently empowered to transfer the property, including an endowment of \$46,000, to the school district, provided the voters of Lowville agreed to accept the site and to erect thereon an adequate school building. It was further required that the new school keep the name of Lowville Academy. This proposition, involving the expenditure of an amount equal to one-sixth the entire assessed valuation of the village, was approved by the voters when put before them for the first time—a fact which speaks well for the progressive spirit and local pride of the citizens of this community.

EDWARD C. OWENS,
Secretary, Lowville Chamber of Commerce.

And Equally True of the City

Every spirit makes its house, but afterwards the house confines the spirit.—EMERSON.

Planning a Water-Works System

A Guide for Communities Considering Establishing Their Own Water-Works Utility

A GOOD water-works system is a town's most fundamental utility. It is the first and most necessary step in the development of the town, and makes it a town and not simply a rural community. A community that has grown to 500 persons cannot afford to continue without a water-works system. Many smaller towns have excellent water systems. Without a water - works the town faces the danger of fire and pestilence. If it has an inadequate or defective water-works system, it is worse off, because the danger is concealed.

The value of property, vacant and improved, in a town is ordinarily increased by a good water-works system to an amount about equal to the cost of the system. Land which previously would not have been considered by any manufacturer immediately becomes suitable for factory sites, because fire protection and running water are absolute essentials in industry. The influx of new industries is an important factor in a town's growth. The cost of running water for each inhabitant would ordinarily be less than 5 cents a day, and the advantages of running water are immeasurable. Running water means health protection, something even more important than fire protection, for typhoid causes more deaths than fire, and the health and welfare of the community are of prime importance.

Engaging an Engineer

The first step in establishing a water-works system is to get a preliminary report on the construction work from a reliable engineer or firm of engineers. The cost is customarily paid from the current funds of the community. Preferably the same man or firm should be retained to carry the work to completion later. Engineers draw up the plans, specifications and contracts and during the actual work supervise the construction. Their fee on completion is usually a fixed percentage of the total cost of the undertaking.

Good engineers are known by their records of achievements. Careful search should be made by the town officials for the right man, and under no condition should a man of questionable professional character be employed. State boards of health can be relied upon to recommend reliable consulting engineers.

Particular Points to Be Considered

A good water-supply improves property values.

A competent consulting engineer should be engaged.

Plans should be approved by the state health department.

A water source of good quality should be chosen.

Don't underestimate either the present or the future water requirements of your town.

Provide adequate water for fire fighting.

Choose pumping equipment that will be the most economical in the long run.

Duplicate pumping equipment as well as mains should be provided.

Install pipe of ample size to take care of future requirements. It is cheaper.

Don't space hydrants too far apart nor against buildings.

Keep adequate records of mains, valves, hydrants and costs. They are invaluable.

Install a master meter at your reservoir or pumping-station to measure total consumption.

Install service meters to measure the consumption of individual services.

Choose an experienced superintendent and pay him well.

Approval of the Plans

In some states approval of the plans by the state board of health is required. In any event it is well to have its criticism and suggestions. The board may send its own investigator to the town to gather the data on which to base its suggestions, or may rely upon the material furnished by the engineer employed by the town. The inspection bureau of the fire underwriters

should also be asked to inspect the complete plans in cooperation with the engineers. The bureau's service is free and it can tell you just what new "classification" will be given the town when the water-works system is installed and can frequently estimate the dollars-and-cents savings that will result from the lowered fire insurance rates. Often the bureau's recommendations for small changes in the details of the plans can increase this saving by bringing the plant even more closely into accord with the requirements for adequacy and reliability of the water system. Any local fire insurance office can furnish the address of the inspection bureau for that locality.

Sources of Water-Supply

The opinion of state health officials should also be sought as to the quality of the water and possible danger of its pollution. Pollution may, of course, occur in a defective system, even though the sources are pure, but the sources should receive first consideration, and measures for their protection should be taken. The question of the hardness of the water is more important than it might seem, as housewives will testify, for the extra expense of profuse soaping required with hard water runs into surprising figures.

Estimating Water Requirements

In figuring the requirements of the town it is always necessary to be liberal. The danger of overestimating the requirements is slight, while that of underestimating them is great. When people use wells and cisterns they are economical, but when they have water from the tap, they find many additional uses for it. They will use about twice as much, moreover, if it is unmetered than if it is metered.

If the town normally uses about 200 gallons per inhabitant per day, as it may easily do if unmetered, it will probably use about 300 gallons per capita daily in summer. People drink more, bathe more, and also sprinkle their lawns and streets, in summer.

The town will need considerable additional water for fire protection. It should be able to maintain a fire flow as shown in the following table, the standard fire stream being one which throws 250 gallons of water through a 1½-inch nozzle:

Population	Fire Flow Required- Gallons per Minute	Number of Standard Fire Streams
1,000 or less.....	1,000	4
2,000.....	1,500	6
4,000.....	2,000	8
6,000.....	2,500	10
10,000.....	3,000	12
13,000.....	3,500	14
17,000.....	4,000	16
22,000.....	4,500	18

Towns of over 2,500 population should be able to maintain the above rate of fire flow for ten hours. Towns of less than 2,500 should be able to maintain it for five hours. This, of course, is in addition to their ordinary needs. A town of 1,000, therefore, should be able to deliver on emergency about 1,250 gallons a minute. Any storage sufficient to give fire pressure can be subtracted from the capacity needed for fire flow. That is, with a storage capacity of 300,000 gallons for fire purposes, about 250 gallons per minute will take care of the domestic consumption and maintain the reserve. These are the standard requirements fixed by the National Board of Fire Underwriters and are taken from the National Board's standard grading schedule, which is the measure by which town fire protection is classified throughout the United States.

The Pumping System

Towns having a source of supply above the level of the town are fortunate in that they can install a gravity system, which, while its original cost may seem larger, can be operated at much lower cost than a pumping plant. Such towns are in the minority, however, as most towns have to depend on a pumping-station and elevated storage tanks.

Formerly, steam power was used exclusively for pump operations. Internal-combustion engines and electric motors are used to a great extent. Pumps are now manufactured and provided with both electric-motor and internal-combustion engine drive, arranged in such a way that in case of the failure of electric power, the engine will drive the pumps.

Duplicate Equipment

Unless elevated storage is provided, pumping equipment, including engines, boilers, motors, steam mains, air compressors, electric generators and electric lines, should be installed in duplicate throughout,

in order that necessary repairs may not interfere with water service.

In larger water-works where pumps will be operated continuously, there are advantages in having two or more pumps of different capacities. All pumps are designed for a certain speed, pressure and delivery, and any variation from these conditions means a large loss in efficiency and economy. The smaller pumps can be used at night, instead of using the larger pumps at reduced speed. Spare parts should, of course, be kept on hand, including several extra pipe lengths, valves, hydrants and engine parts.

Storage of Water-Supply

Storage capacity should never be less than 50,000 gallons, even in small towns. In some instances it is possible to operate the pump during the day and to use the storage for night supply, which ordinarily is about one-third of the maximum daily consumption. Storage of sufficient capacity to take care of five days' maximum domestic consumption plus ten hours' fire flow will lessen the need of duplicate equipment, inasmuch as most repairs can be made in that time.

The Distributing System

It is in this part of the plans that the town officials are most likely to underestimate the future needs of the town. This is often a costly error. Practically all towns grow in population from year to year. The system should be planned to be adequate just as far ahead as the vision and ambition of the citizens will carry them. Pipe that has been outgrown and is overtaxed will so consume the water pressure by friction as to make the supply practically useless in a fire. It may cost ten times as much to tear up and replace outgrown pipe later as to install pipe of ample size at the beginning. The life of a well-built central water-works is about 50 years, and the cast iron pipe mains may as well be big enough at the start.

Laying the Pipe

Mains should be of a sufficient size to provide for ordinary domestic consumption plus the required fire flow, without giving excessive pressure loss. Especially should the supply lines be in duplicate and generous

in capacity, so that interruption in service in one will not deprive the town of water. Feeders should be of sufficient size, considering the length and the character of the section served, to deliver the fire flow necessary for the district, and should be looped so that no district will have to depend on a single feeder. Sometimes in small towns a single large main is run down the principal street, with no other large feeder from the supply. This is a serious error, because important sections then have to be shut off to make repairs, to repack valves or handle emergencies.

Mains should be gated so that not more than a quarter of a mile within the distributing system will be affected by a break. All branch circuits should have gate-valves at junctions with feeders.

All mains should have a minimum cover of at least 2 feet to prevent injury from traffic. It is advisable to lay them deeper, that is, from 4 to 7 feet, to prevent freezing. Water expands when freezing, and a frozen main generally means a break. The character of the soil also is important, as freezing takes place quicker in moist, compact soil.

Metering Services

There is almost universal agreement today that all domestic and industrial services should be metered. Where the flat rate is in force, there is no incentive for the consumer to save water, and every drop of water either used or wasted costs money to impound, store, pump, filter and distribute. The ownership of meters should be vested in the city, which should also keep a good stock of repair parts on hand at all times. A meter-testing machine should also be purchased and meters tested regularly for accuracy, as an inaccurate meter can produce a dissatisfied customer about as quickly as any failure in water-supply service.

Hydrants

Hydrants are cheaper than fire hose. Friction in water-mains is less than friction in fire hose. These two facts should be continually borne in mind in laying out systems. The friction loss in good hose is 10 pounds per 100 feet of hose. Consequently, 50 pounds pressure at the hydrant will be reduced to an ineffectual trickle by

the time it has passed through 500 feet of fire hose. It takes three streams throwing 250 gallons per minute apiece to subdue the average residence fire after it has had a good start.

Mercantile districts should have at least one hydrant at each street intersection, not only on the principal street, but on the parallel streets. No important building should be more than 500 feet from at least two hydrants. On the other hand, hydrants should not be too close to a building. If too near, the firemen may be driven away by the heat, or the hydrant and hose may be put out of service by falling walls. For this reason, where possible, it is wise to alternate the locations of hydrants on two sides of the street.

Hydrants should always have 6-inch connections to street mains to cut down friction loss and should have auxiliary valves so that they can be tested and repaired without shutting off the mains, particularly those hydrants which are located on feeder mains. Where fire pumps are used, hydrants should also have pump outlets.

Hydrants should be inspected, tested and flushed frequently in the spring and fall, and if subject to freezing they should be under constant supervision in cold weather, when most fires occur. Freezing is almost always caused by poor setting or a leaky valve. It may be caused by ground water collecting in and around the barrel. To prevent this, it is well to dump loose gravel at the bottom of the pit when the hydrants are first set, to permit quick drainage. Inasmuch as the best water system is of little use in a fire if the hydrants are not serviceable, regular testing, oiling and repairing of hydrants should be considered as an essential of fire protection.

Water-Works Records

When the water system is installed, the engineering plans should be guarded with the greatest care, to be used for future reference. Without them exact information about the system may be unobtainable,

the only other source being the memory of the superintendent or the engineer. Loss of this information may entail, in the most literal sense, a lot of costly digging.

The records should be kept up to date. When additions or alterations are made, notations and alterations should be made on the plats. The location of gate-valves should always be known. Otherwise it may be necessary to cut off the entire supply in case of a break.

Measuring Water Consumption

Even with a gravity supply it is of importance to know the amount of water used. Figures of water consumption are of value in estimating future needs. In no other way can the amount of waste or leakage be determined. Sometimes a town will spend money unnecessarily for plant extension when the proper course is to eliminate hidden leakage. For this reason it is advisable to install a master meter at the pumping-station or on the gravity supply main. Furthermore, at regular intervals of a few years, pitometer water-waste surveys should be conducted, to make sure that the mains are tight and to determine whether they need to be cleaned.

Choosing a Superintendent

The office of water-works superintendent is an important one, as is indeed the office of any one connected with the water service. It goes without saying that the superintendent should be competent, experienced, and independent of political factions. He should be sure of his job as long as he fills it efficiently, and no longer. He is responsible for the lives and property of the entire citizenry. He can be the cause of great financial loss and personal damage to the community, or he can be an active factor in helping it to grow from a town to a prosperous and healthy city. Choose him carefully and pay him well.

ACKNOWLEDGMENT.—Prepared in part from a pamphlet issued by the Cast Iron Pipe Publicity Bureau.

Publication of Council Proceedings in Local Newspapers

FORTY-FIVE cities of New York State have replied to an inquiry from the State Bureau of Municipal Information as to whether the city publishes the official proceedings of its Common Council (exclusive of legal

notices) in one or more newspapers. The affirmative replies are fifteen in number, and the negative replies thirty. A report issued by the Bureau gives for several of the cities the prices for publishing the proceedings.

Chamber of Commerce Activities in Public Affairs

Civic Bodies Unite to Study City Budget

DETROIT, MICH.—Since the first of this year, the Detroit Board of Commerce has taken the initiative in a program that promises to have far-reaching results. At the call of President Harold H. Emmons, representatives of the leading business and civic organizations of Detroit were brought together to discuss the possibilities of organizing a group to work in conjunction with the city government, and subsequently what is now known as the Governmental Committee was formed. This is the first time that an attempt has been made in this city to bring together in one working unit the representatives of such groups as the Council of Noon Luncheon Clubs, the Detroit Real Estate Board, Business Property Owners Association, Wholesale Merchants Bureau, Employers Association of Detroit, Michigan Manufacturers Association, Milwaukee Junction Manufacturers Association, Retail Merchants Association, Department Store Group, Detroit Automobile Dealers Association, Detroit Clearing-House, Bureau of Governmental Research, Detroit Citizens League, Postal Employees, Detroit Stock Exchange, Woodward Avenue Improvement Association, Builders and Traders Exchange, Associated Building Employers of Detroit, Associated Technical Societies of Detroit, the Detroit Board of Commerce, and other similar groups.

While various civic and business organizations have in the past attempted to relate themselves to the activities of some phase of the city government, the results have not always been successful, mainly because criticism could so easily be raised against individual groups assisting in matters that are presumably of intimate concern to those particular bodies. However, when all the business and civic organizations band together for a closer tie-up to the entire program of city government, much good will no doubt result.

A permanent program of work is now being mapped out for this Governmental

Committee, and the first undertaking, that of helping in the preparation of the city budget, is in progress at the present time. Each group represented on the Committee has been assigned the task of cooperating with one of the city departments in an effort to become better acquainted with the work of that department and to assist where possible in the preparation of its departmental budget. One of the matters to be considered in the near future by the Committee as a whole is the possibility of working out a balanced budget for all the departments of the city, based on the average expenditure of each department over a period of ten years.

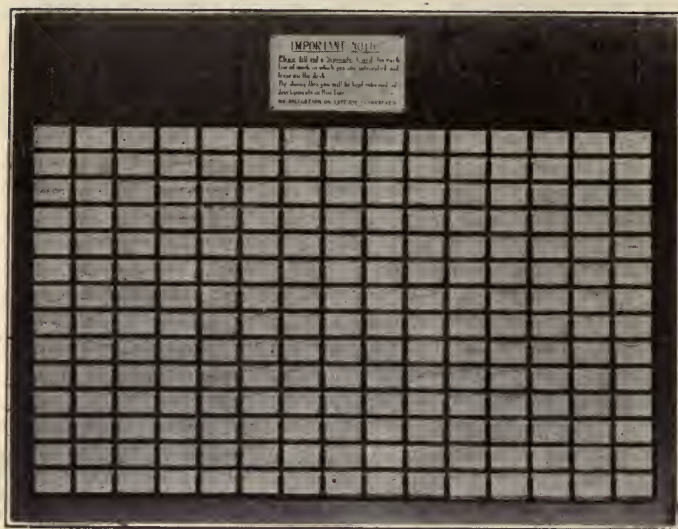
Through close cooperation with the city officials, the Committee hopes to succeed in modernizing the various city departments and to effect considerable savings through the introduction of more efficient business methods.

C. E. BOYD,
Assistant Secretary, Detroit Board of Commerce.

Visualizing the Problems of a Community

PARIS, KY.—Any person in this city interested in the wide variety of activities being carried on under the direction of the combined commercial, civic and recreational organization known as the Paris City Service Club, may now see at a glance the daily status of each project. This has been made possible by an unusual scheme devised by the Club, and worked out in this way:

The Club has had prepared locally two frames, or charts, as they are called, each measuring 5 by 7 feet, and each containing spaces for 210 3- by 5-inch cards. The cards are read horizontally from the left. The left vertical column of each of these frames lists the lines of work in which the joint organization is engaged; in the second column are listed the names of the committees in charge of the various projects; and the third column shows the "Condition, January 1, 1924." The remaining columns are devoted to data on all phases of the work, appearing under the following headings:



COMMUNITY ANALYSIS CHART, PARIS, KY.

The notice at the top reads: "Please fill out a Separate Card for each line of work in which you are interested and leave on the desk. By doing this you will be kept informed of developments in this line. No obligation or expense is involved."

Purpose; Steps; Assignments; Schedule; Conditions Delaying Progress; Organizations Cooperating; Outstanding Office Work; Steps Taken to Date; Dates of Meetings; and New Recommendations.

The chart, therefore, visualizes in brief the purpose of each project, the steps to be taken to accomplish the purpose, and the tasks assigned to the individual members. The latter card also indicates whether or not the assignments have been accepted. Then follows the schedule of accomplishments for each part of the task, including follow-up dates, etc. The listing of conditions delaying progress often shows that delays are due to trivial and easily removed causes, though occasionally, of course, it is seen that a serious obstacle stands in the way. The next card, headed "Organizations Cooperating," frequently shows that a single organization is playing a lone hand when better and quicker results might be obtained through cooperative activity. The outstanding office work is divided into three columns—executive, clerical and stenographic, and this record of unfinished tasks tends to hasten their completion. Whether or not the committee is actually getting results may be plainly seen by the list of steps taken to date, and the next card, "Dates of Meetings," in addition to being a useful calendar of future meetings, helps to show

whether or not progress is being made. In the last column may be noted recommendations in connection with any line of work, and these suggestions receive the attention of the committees concerned.

Active business men and others who so often find it difficult to keep in mind from one meeting to the next the status of the projects in which they are particularly interested, will without doubt welcome a visualization of activities such as appears on a chart of this kind. Such a scheme will not only assist them in carrying out the tasks for which they themselves have assumed responsibility,

but will tend to extend the scope of their interest along other lines.

WALLACE HATCH,
Executive Secretary, Paris City Service Club.

Community Spirit in Terms of Fire Engines

GREAT BARRINGTON, MASS.—This town's up-to-date motor fire-fighting machine is not only efficient but neighborly, having within the last few months saved two nearby communities from serious conflagrations. It has been pointed out, however, that in providing protection for outside towns, the local fire department has laid itself open to criticism inasmuch as Great Barrington is left practically unprotected while the large engine is engaged elsewhere. The Chamber of Commerce, therefore, has started a movement to obtain another "community" fire truck, this to act as an understudy to the town's big machine. The new truck could then be used to answer all first calls for aid from other towns, leaving the large truck at home to provide proper protection there. If this idea is carried out, it is thought possible that some of the neighboring towns will contribute toward the purchase and upkeep of the auxiliary engine. Proponents of the Chamber's plan emphasize that while neighborliness is a most excellent quality, it may perhaps be carried to excess, as happened,

for example, in the case of a recent fire which occurred eight miles from Great Barrington. On this occasion seven or eight motor trucks from surrounding communities answered the call for help, though only one was needed, thus leaving a large section of southern Berkshire temporarily unprotected.

As an alternative to the community auxiliary fire engine plan, it has been suggested that only one or two trucks be sent in answer to a first alarm, others to follow if the need becomes great. But, whichever plan is adopted, behind them both is the community spirit expressed in terms of fire engines.

FRANK J. POPE,
Secretary, Great Barrington Chamber of Commerce.

Achievements of a Progressive Park Board in a Small City

MIDDLETOWN, CONN.—Two years ago, at the suggestion of the Chamber of Commerce, there was created by the Mayor and Common Council of Middletown a Board of Park Commissioners of five members, one member to be replaced each year. Although most of the citizens approved this action, it was felt by many that the Board was bound to be more ornamental than use-



GIRL SCOUTS OF MIDDLETOWN "NUMBERING" ON WILCOX ISLAND

ful. Its subsequent activities have, however, clearly demonstrated that even in a small city with attractive rural districts easily accessible, a park board can render very effective service.

During its two years of service the Board of Park Commissioners has succeeded in rehabilitating two small city parks which were suffering badly from neglect; it has employed expert gardeners to go over the grass, trees and shrubs and put them in condition; in the case of the larger plot—a typical New England "green"—curbing has been laid down, seats for the public have been provided, and the general usefulness of the area much increased.

The principal achievement of the Board has been the development of an island of thirty acres of woodland in the Connecticut River near Middletown, recently presented to the city by a public-spirited citizen, W. W. Wilcox, for general recreation purposes. The underbrush has been cleared away, play apparatus installed, a shelter erected and sanitary conveniences provided. Tables for picnic parties have been built and a camp site prepared.

As the island was accessible only by water, a



BOY SCOUTS ENJOYING THE CAMPING PRIVILEGES OF WILCOX ISLAND, MIDDLETOWN, CONN.

foot-bridge was constructed from the shore across an arm of the river. A formal opening was arranged; and although it was well towards the close of the season, hundreds of citizens flocked to the new park and were delighted with its beauty and its possibilities for future development. Local troops of Boy Scouts and, later, visiting troops of Girl Scouts made short camping expeditions to the island.

The plans of the Park Board include the construction of a permanent suspension bridge to the island, a special trolley stop for the convenience of the public, a permanent administration building, water-supply, adequate lighting, etc. An appropriation of \$10,000 has been asked for in the city budget of 1924. T. C. DeWolf is Chairman of the Board.

T. L. HINCKLEY,
Secretary, Middletown Chamber of Commerce.

Better Utility Service Through Contact and Understanding

NEWCASTLE, IND.—To secure a greater development of the public utilities serving the city, and thereby improve the gas, electric light, railroad, traction and telephone services, the Newcastle Chamber of Commerce adopted three years ago a policy of cooperation with these utility companies. As its first step in this program, the Chamber invited the officials of the various companies, in groups, to be the guests of the organization at its regular monthly forum dinners. The officials of the Interstate Public Service Company were the first guests under this new plan, and on this occasion the Vice-President of the Midwest Utilities Company was the principal speaker. At the next meeting, representatives of the Big Four, Pennsylvania, and Nickel Plate railroads were present, and as part of their entertainment a trip through several local industrial plants was arranged. Other such meetings followed, and the Chamber's program of cooperation gradually developed and extended.

Through this personal contact between the business men of Newcastle and the officials of the companies, a keener interest in the welfare of this city on the part of the utilities has been established, and the

people, in turn, have reached a better understanding of the organization and operation of the companies serving them. This spirit of cooperation has been evidenced in the quick and amicable settlement in the last few years of those questions which are so apt to arise between a community and the public utilities, and, further, has led to some important developments making for improved service to this city. The tying-in of Newcastle with a hydro-electric station has given the city an ample supply of power, at low rates, and the new gas plant now under construction with a capacity for handling twice the present needs of the city, will assure an adequate gas supply for some time to come. The construction of a viaduct under the Pennsylvania and Big Four railroad tracks, which will open a large tract for building sites and eliminate a very dangerous grade crossing, has also been decided upon. Thus it has been demonstrated in Newcastle, through the initiative of the Chamber of Commerce, that a city may find it well worth the effort to cultivate the friendship and good-will of its public utilities.

S. A. WARNER,
Secretary, Newcastle Chamber of Commerce.

Local Tax Valuation List Published

PORTSMOUTH, N. H.—Acting upon a recommendation made by the Taxation Committee of the local Chamber of Commerce, the City Council of Portsmouth has just issued, in book form, a complete list of all properties assessed in this city for the year 1923, with the names and addresses of the property owners, and the total personal and real estate tax valuations. The idea that this valuable list be compiled and published in this form originated at a meeting of the Taxation Committee in March, 1923, when the suggestion that the City Council be asked to undertake the publication of such a work received the favorable vote of all members present. The idea was subsequently presented to the Board of Directors of the Chamber and, with their unanimous approval, a formal recommendation on the subject was submitted to the City Council.

ROBERT J. EUSTACE,
Managing Secretary, Portsmouth Chamber of Commerce.

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TRAFFIC PATHS INDICATED BY BEACONS AND LOW IRON MARKERS, PITTSBURGH, PA.

How Intersections Figure in Traffic Accidents

By George G. Kelcey

A VERY important law relating to traffic is the law of least resistance.

Traffic uncontrolled will follow a course that is easiest, rather than take the right course, which is often the hardest.

A check in five localities confirmed the following figures, which were determined in one city: of 247 cars turning left from one street into another, only 31.2 per cent made the proper turn; 68.8 per cent made short left turns, mostly at high speed and in a dangerous fashion.

When two moving elements of traffic meet at right angles, there is no confusion. When they intersect at an acute angle, a confusion area is developed which increases as the angle and speed increase.

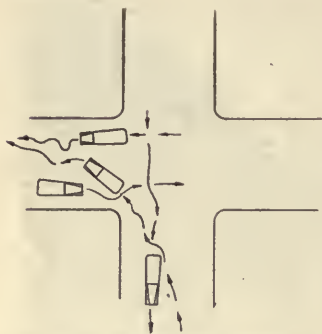
The shortest and easiest course for a left-hand turn at a street intersection—in other words, the line of least resistance—is to make a short turn and pass close to the curb. Such a vehicle gets on the wrong side of two streets, where it is not expected by other vehicles or pedestrians.

A vehicle, making a short left turn,

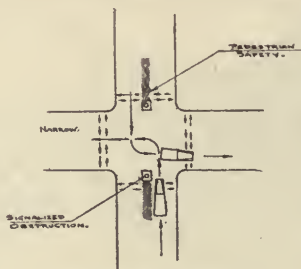
crosses two sidewalk areas and intersects with three other streams of vehicles at an acute angle. This produces the same effect on the drivers and pedestrians as a person walking diagonally across an intersection through traffic.

Vehicles which take wrong courses usually do so because they can maintain a high speed. Therefore, speed is always a factor. As a means of control, assume that all traffic is compelled to circle a spot in the center of the intersection. The accompanying diagrams will show that under such conditions every vehicle intersects with every other vehicle at a right angle, and that every vehicle is in its proper channel. It is also evident that all vehicles intersect pedestrian crosswalks at a right angle.

The object of traffic control at intersections is to check speed so that a vehicle is under easy control, and to compel right-angle intersections. The only practical way to create such conditions is to place obstructions so that they will not interfere with the normal passage of traffic, but so



Confusion caused by unregulated traffic at intersections



Traffic-signalizing obstructions block wrong paths on narrow or car-track streets



Wider streets permit center installation of traffic beacons



Traffic always takes the shortest cut across an area. The wide flare of acute-angle streets is particularly dangerous to pedestrians



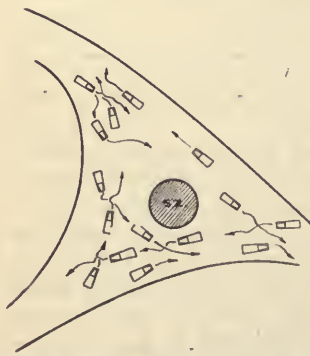
Traffic can be channelized and made orderly if proper areas are marked out or curbed



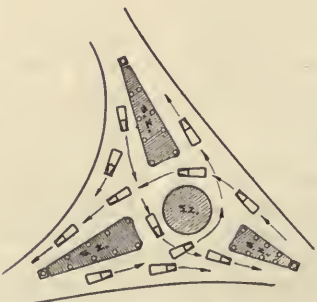
When several vehicles take short cuts at the same time, accidents are frequent



Circular traffic, where it applies, is the right solution. Rotary movement is the traffic ideal



It took four officers to handle this situation. Accidents were frequent and there was much congestion



Traffic organized and congestion eliminated

that they will block out courses of traffic which are wrong.

An obstruction used for the control of traffic is most effective if it definitely prevents traffic from doing something that is wrong. A properly shaped block of concrete illustrates the point. Such an obstruction must be effectively signalized. The signal has a strong moral effect, and identifies the obstruction; in addition, signals are used to carry directional or police wordings which instruct traffic as to proper procedure or routings.

In streets with pavement widths of 36 feet or more, or with well-rounded curbs, a signal can be used in the center of the intersection. For narrow streets without well-rounded corners, the turning radius around a center obstruction would be so small as to delay traffic. In such cases two signals should be used, one each in the throats of the less-traveled of the intersecting streets. These obstructions and signals definitely block out the short left-hand turn of any vehicle going out of or

coming into this street. A vehicle going out must go straight out until it comes to the curb line. Having reached this point, it is hard to turn inside of, or to the left of, the center of the street. A vehicle entering the street by a left turn is blocked from taking a short cut; it must pass around the center of the street and come straight in. The result is a right-angle intersection of all vehicles and with all pedestrians. Furthermore, they must be at control speed to make the turn. Observe that the signal installations not only control the traffic, but create pedestrian safety zones.

A traffic problem shown at the bottom of page 418 illustrates this discussion and the principles outlined. The problem was a large traffic area in a park with a monument in the center and much pavement space. Analysis showed that there were six major intersection points of traffic in the area, all of them at very acute angles. Traffic approached all the intersection points at speed. Four officers were employed, and in spite of this there were a number of acci-

dents. During the peak hours of traffic, in the morning, cars sometimes lined up four to five blocks along one approach. In the evening a similar congestion resulted in the opposite direction.

A way was found by which the six major intersection points of traffic were reduced to three. These three were moved up close to the monument, so that the three intersections were made as part of a rotary traffic movement. Traffic intersected at these three points at right angles. The problem was so worked out, by means of unattended signals, that there was only one possible course for each line of vehicles to take through the area. These courses produced the effect desired, at a cost of less than \$1,500 for the correction, which included three additional safety areas for pedestrians. All four traffic officers were eliminated, and there have been no men on duty at this point since April, 1921. It is reported that at no time has there been any congestion of vehicles, and accidents at the point have been decidedly reduced.

Tom Sawyer Had the Right Idea

By H. E. Boggess

THE fence had to be whitewashed. No getting away from that. And Tom wasn't very enthusiastic about his job. It was *work*, and it was Saturday. Along came Ben Rogers and others of his chums. They "kidded" Tom about having to work. "Work," snorted Tom, in deep disgust, "this is *play*!" Besides, it was something that called for expert attention. After a while, Ben wanted to try his hand at it. Tom refused—it was too much fun. Ben insisted. He offered Tom a big, red apple, and Tom surrendered his white-wash brush.

Tom had the right idea.

He "put it up" to his comrades on the basis of play. It was fun, he said, and they "fell for it."

It is much the same in education. Assignments of the classroom are regarded as work. The lessons you are teaching—the principles of conduct you are trying to encourage—are not always accepted at face value. They lack the saving element of fun, and are frequently "discounted."

Boys and girls seldom put their hearts and souls into this classroom work. It must be done—and so they do it. It is a duty—it is work.

Why not "put it up" to these boys and girls on the basis of play? This is different. Heart, mind, and body are yours. The heart is open, the mind alert, the body active. It is fun—it is play.

Tom Sawyer discerned the mighty chasm that separates these two—work and play. He turned this difference to his own lazy advantage.

The teaching profession has discerned the same vital distinction, and in a much bigger way. Teachers are taking advantage of this difference to further the larger ends of education. They realize that youthful minds often make an "allowance" for classroom lessons and that the lessons of the playground are accepted without a minimizing mental reservation.

The playground, however, cannot shoulder the entire burden. To be sure, the correct way to spell "seneschal" or "chrysan-

themum" will never be learned while playing volley-ball. Nor will the exact distance between Vladivostok and Copenhagen ever be arrived at on the giant stride. Nor the interesting fact that on the 4th of September, 1725, Louis XV. married Marie Sesczynski, daughter of Stanislaus—this will never be learned on the merry-go-round.

Perhaps these things are very important. It is certain, at least, that most lessons taught in the modern schoolroom possess a definite value. But are not the following lessons equally important—loyalty, obedience, cooperation, sacrifice, fair play?

These are the lessons of the playground. Nowhere are they learned more effectively. Nowhere do they receive the same serious and receptive consideration. For the work of the playground is play. Because they are a definite part of the game, the child accepts the lessons. These lessons become a part of daily lives.

In addition to developing the physical body, the playground is an excellent builder of character. Young America learns to be loyal—to "stick up" for its own side. Boys and girls—in the most formative period of their lives—learn to work and cooperate with others. They learn to play the game fairly and squarely—to obey the rules or be put out. The "bad boy" problem (which is largely a problem of misdirected energy) is partially solved. Personalities which are inclined to be bashful and shy develop a sense of confidence.

It is on the playground that the child learns what is fair and what is unfair—what is right and wrong—what is honorable and what is underhanded. It is there that the rules for the game of life are worked out.

And we have come to realize the importance and the possibilities of play. We understand—now—that the adolescent mind is peculiarly receptive while at play. We have decided to take full advantage of this fortunate situation. We are teaching many important lessons of conduct, and we are teaching them at the right time—when boys and girls are most responsive.

With the general recognition of the possibilities of play, has come the recognition that the playground, also, has large possibilities. Not so many years ago, we considered a playground as an open space cleared, more or less, of rubbish. Playground equipment, if there was any, was of a nondescript nature. There were few

definite standards. There was little regard for safety, and even less for appearance. Grounds were laid out in a careless and haphazard manner.

This attitude of mind has experienced a sharp reversal. The playground is coming into its own. Hundreds of thousands of dollars are appropriated annually for playground purposes. Not only in the large cities, but also in towns, villages, and rural districts, the playground has been a tremendous force for Americanism and an effective aid to juvenile decency.

Gradually there is growing up a science of the playground. We are beginning to sense the tremendous possibilities, and we are learning the playground business. Confronted with a certain situation, we know what to do.

Granted, for example, a plot of ground—what may be done with it? How can we use every square foot to the best possible advantage? What type of equipment is best suited to the space at our disposal? Where shall the various units be placed? How shall we lay out the grounds? Are we providing plenty of equipment—and equipment which completely satisfies the play instincts of our different groups of children?

These questions cannot be answered—all of them—casually. At least, they should not be. For every plot of ground presents its own peculiar problems. No two groups of children have the same equipment needs. There are, however, certain things that we can settle upon—certain facts that have been definitely determined.

In the first place, the successful playground will always be clean, neat, and inviting. It must compete with the not-to-be-denied appeal of railroad tracks and dangerous streets. It should be free from weeds, gullies, stones and cinders. Children should be taught to regard it as their own. They should be encouraged to keep it free from scraps of paper and rubbish.

In the second place, equipment should be adequate; it should be safe; it should be durable; it should be strong. Not always is this matter of equipment given the consideration it deserves. Selections are frequently made at random, and units are placed in the same manner. Equipment is sometimes positively dangerous. One unit may interfere with another. Equipment may not be suited to the needs of individual schools. One group or type of children



Drawn by Clifford Knight of the Hartford Post for THE AMERICAN CITY

THE KIDS: That's a fine plan, Mister, but where are the playgrounds?

may be favored, another slighted.

There are many possibilities for mistakes, and even more possibilities for success. Fully equipped playgrounds do not, as a rule, spring into existence over night. They are the result of careful planning and well-informed buying. They experience a slow, steady, healthy growth.

A good, clean playground—with plenty of good, safe equipment and with adequate

supervision—is a pretty good indication that the officials in charge have discovered the same principle that came to Tom Sawyer when he had to whitewash the fence. They have come to realize that play is the normal and natural work of the child. They have learned that the very best time to reach the child is when he is lost in the spirit of play. The youthful mind is then—and only then—wide open.

Traffic Problem in 1916 and 1923

HOW rapidly traffic regulation has become an acute problem in the smaller communities is evident from the conditions of seven years ago as compared with those of to-day.

In 1916, Henry C. Wright, one of the Commissioners under the Mitchell administration in New York, wrote in *THE AMERICAN CITY*:

"Cities of less than 200,000 population seldom have traffic congestion that necessitates regulation."

Although the conditions of to-day are too generally and acutely known to need much elaboration, the following figures from a town

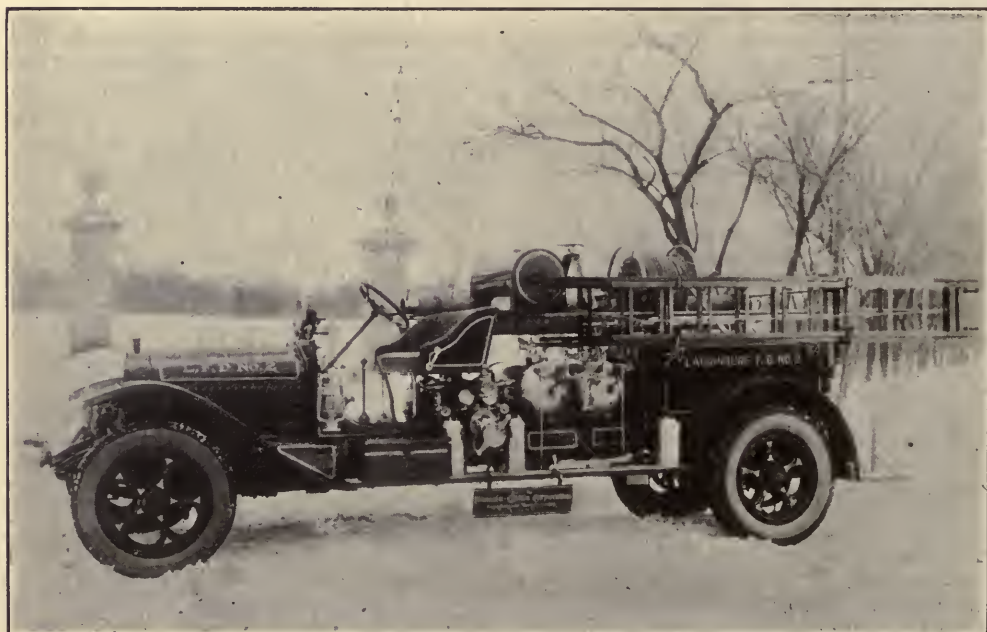
of 3,000 are illuminating:

In Los Gatos, Calif., on Saturdays, Sundays and holidays the cars passing the main corner of the town are counted, with an automatic checker, from four to ten hours during the busy time of the day. From this official count, H. O. Baird, Town Marshal, reports that in 160 hours, from May 20 to September 10 last, 163,331 cars used this corner, an average of 1,021 cars per hour. The greatest number of cars in ten consecutive hours was 15,270. The greatest number in one hour was 2,437, at which time there was not room for one more car in the line for more than five miles.

Motor Fire Apparatus in the Service of American Cities



A CHILDS TRIPLE-COMBINATION PUMP, CHEMICAL AND HOSE CAR MOUNTED ON A WHITE CHASSIS, IN SERVICE AT LAURINBURG, N. C.



GMC TRUCK, EQUIPPED BY THE NORTHERN FIRE APPARATUS COMPANY, WHICH SUCCESSFULLY PASSED THE 400-GALLON UNDERWRITERS PUMPING TEST BEFORE DELIVERY TO THE FIRE DEPARTMENT OF BEATRICE, NEBR.



THREE AHRENS-FOX PUMPERS IN A RECENT TEST OF THE SPRINKLER SYSTEM INSTALLED ON THE EXTERIOR OF THE UNION CENTRAL LIFE INSURANCE COMPANY BUILDING CINCINNATI, OHIO



THE FIRE DEPARTMENT OF MOBILE, ALA., TESTING A DELIVERY OF FIVE AMERICAN-LAFRANCE TYPE 75, TRIPLE-COMBINATION PUMP, CHEMICAL AND HOSE CABS OF 750 GALLONS CAPACITY, AND ONE TYPE 12, TRIPLE-COMBINATION OF 1,000 GALLONS CAPACITY

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

State Control Over Municipal Funds

"CITIES are mere instrumentalities of the state, for the convenient administration of government; and their powers may be qualified, enlarged, or withdrawn at the pleasure of the Legislature, and the revenues of a city raised by taxation, though levied for specific public purposes, are so far subject to the legislative will that by it they may be applied to other uses of the municipality, subject, of course, to constitutional limitations."

This statement, taken from the opinion of the Nevada Supreme Court in the case of *City of Reno vs. Stoddard*, 167 Pacific Reporter, 317, is in line with what the courts throughout the country hold, as applied to cities not operating under home-rule charters.

In the case of *Tippecanoe County vs. Lucas*, 93 United States Reports, 108, the highest court of the land decided that the power of the state was broad enough to permit the Legislature to direct a restitution to taxpayers of funds exacted from them by taxation. But the United States Supreme Court also declared, in the case of *United States vs. Quincy*, 71 United States Reports, 535, that where a state has authorized a municipal corporation to contract, and to exercise the power of local taxation, to the extent necessary to meet its engagements, the power cannot be withdrawn until the contract is satisfied. The Court held that "the power given becomes a trust which the donor cannot annul, and which the donee is bound to execute; and neither the state nor the corporation can any more impair the obligation of the contract in this way than in any other."

In the case of *Davock vs. Moore*, 63 Northwestern Reporter, 424, the Michigan Supreme Court sustained the validity of an act of the Legislature directing a transfer of funds for use by the Health Department of the city of Detroit. The Court re-

marked that "the preservation of the public health is not a local purpose, and the consent of the locality is not material, where the function is a public or general one." And, holding that there is no constitutional bar, so far as a city is concerned, to its being compelled to transfer money from one fund to another, and that a city had no vested right in liquor tax revenues, the Court added:

"The Legislature had the right to impose the burden upon the city to defray the expense of the health board, and it cannot be said that the transfer of money from one fund to the other to pay a debt deprives the city of its property, within the . . . United States Constitution. It is apparent . . . that the City Treasurer had sufficient funds on hand to make the transfer without detriment to the city, or to any of the objects to which those particular funds were appropriated, and the fund from which the moneys for the health board are to be taken is to be replenished by the moneys from the liquor taxes. The fund from this source is absolutely under the control of the Legislature. While the property which a municipal corporation acquires in the exercise of its corporate powers is protected from legislative interference as vested rights, yet in provisions of the law for the revenue of the city, whatever form such provision may take, the city has no vested right; and the Legislature may at any time, so far as the municipal corporation is concerned, change and modify, or altogether take away the particular source of revenue."

It was decided by the Ohio Supreme Court in the case of *Alter vs. Cincinnati*, 46 Northeastern Reporter, 69, that the Legislature had power to provide that water-rents collected by defendant city should be applied to aid construction of water-works.

In the case of *Horton vs. Newport*, 61 Atlantic Reporter, 759, the Rhode Island Supreme Court decided that the state might require municipal corporations to pay the salaries of local police officers, although such officers were officers of the state and appointed under its authority, saying:

"It would appear upon general principles that, if the general assembly has the right to 'control police,' although their duties are confined to a certain locality, it would have the equal right to provide for the payment of the expenses of the local police department out of the local funds of the municipality, and that such payment could lawfully be required only out of such funds; and, upon examination of the authorities cited, such is found to be the law."

The Court cited a similar decision

reached by the Maryland Court of Appeals, and a decision of the Missouri Supreme Court upholding a law which charged Kansas City with payment of a criminal court's stenographer. Additional authorities are cited "as to the general power of the Legislature for the appropriation of funds of county, town, or city for the purpose of paying for local improvements or for the payment of disputed claims, etc."

Sundry Items of Municipal Law

Traffic Ordinance Held to Be Void for Unreasonableness

An ordinance forbidding, under penalty, that vehicles be driven along a street, excepting as "near as possible" to the right-hand curb, is void for unreasonableness, according to the holding of the Indiana Supreme Court in the case of *Bennighof-Nolan Company vs. Adcock*, 141 *Northeastern Reporter*, 782. The Court said:

"The entire width of a highway is devoted to public travel, and the authority of the city over the streets was conferred in general terms. It was only 'to regulate the use of streets and alleys by vehicles.' . . .

"But obviously an ordinance which attempted to make it unlawful to drive on any part of the street except 'as near to the curb as possible' on either side would not be a reasonable traffic regulation. Whether the city had power, by ordinance, to require that vehicles be driven 'as near as practicable' to the right-hand curb, is not a question before the Court, but we doubt its power to exclude automobiles that keep to the right of center from traveling near the center of a paved street when not required to turn out to the right side for another vehicle to pass."

"Silent Policeman" as Street Obstruction; Notice of Damage Claims

A concrete post maintained by a city at a street intersection to guide traffic, without any guard, and without any light or other means of notifying persons traveling upon the street of its presence, constitutes a defective condition in the street, within the meaning of a statute, requiring written notice to be given a city of injuries resulting from such defects within sixty days as a condition precedent to maintaining action on account of such injuries. In reaching this conclusion in the case of *Titus vs. Town of Bloomfield*, 141 *Northeastern Reporter*, 360, the Indiana Appellate Court said:

"The manifest purpose in the enactment of the statute under consideration was to enable the officers of a city or town to make an investigation of the nature and validity of a claim for damages at a time when the facts could be best ascertained; the purpose being not only to make possible a timely investigation

of the alleged defect, but also as to the extent of the injuries claimed.

"It is well settled in this state that actual knowledge on the part of the officers of a city or town of all the facts will not dispense with the written notice required by the statute."

Discriminatory Ordinance Held Void as a Fire-District Regulation

An ordinance of the city of Shreveport, forbidding conduct of the business of a junk dealer within the established fire limits of the municipality, excepting in brick buildings, has been declared by the Louisiana Supreme Court to be void. In this case, (*City of Shreveport vs. Schultz*, 98 *Southern Reporter*, 411), the Court said:

"If we could imagine any plausible basis for this classification of the junk dealers, as distinguished from all other merchants, and for this discrimination against the junk dealers and in favor of all other merchants, we would be constrained to defer to the judgment of the municipal council—assume that the reason for the discrimination was sufficient—and declare the ordinance valid. But we find it almost as hard to reconcile our judgment to the discrimination in this case as it would be if the ordinance prescribed dealers in asbestos, or fire extinguishers, not kept in fire-proof buildings."

The ordinance was found to be unjustly discriminatory as restricting business in which the fire hazard is small, while more hazardous businesses were exempted.

City Held Subject to Injunction on Account of Practices in Operating Light Plant

Where a privately owned and operated light plant competed with a municipally owned and operated one, the owner is entitled to enjoin the city from enforcing burdensome and unreasonable ordinances which are manifestly intended to handicap unfairly the private plant in securing and retaining patronage, holds the Texas Court of Civil Appeals in the late case of *City of Bowie vs. Painter*, 255 *Southwestern Reporter*, 490. Judgment was awarded against the city under a claim that it had adopted ordinances prohibiting the privately owned plant from offering certain inducements and free service that were offered by the municipal plant.

THE AMERICAN CITY

CATERPILLAR

Reg. U.S. Pat. Off.



The "Caterpillar"* Always Cuts Costs

The "Caterpillar" has furnished cities and townships of every size the means for making tax funds go furthest. A sturdy, practical tractor, developed to its present perfection through a world-wide, diversified experience such as no other machine can boast, used and endorsed by experienced city, road and park officials, state highway departments, governments, contractors, engineers and industrial plants, the "Caterpillar" can be depended upon for economical performance, no matter what the tractive job may be. It soon pays for itself through the economies it effects over old and cumbersome methods. It saves the cost of labor, eliminates teams and has the strength and endurance to stand up under continuous heavy duty.

There is a "Caterpillar" of size and

capacity to meet the public-works budget of every city, town and park board. The 2-Ton is a fast, compact worker, invaluable for all the lighter jobs. The 5-Ton is equal to any medium power need; hauling, road-making, maintenance, snow removal, scarifying, etc. The 10-Ton is supreme in the heavy duty field, easily handling the largest size graders, scarifiers, snow-plows and provides the most economical power for transportation of materials.

We invite inquiries from city, park and road officials concerned in getting the most work done at the least cost. Let us give you actual records of reductions in cost effected by "Caterpillars" in every class of municipal work. *Back of every "Caterpillar" is Holt's positive guarantee of satisfactory performance.*

**There is but one "Caterpillar"—Holt builds it*

THE HOLT MANUFACTURING COMPANY, Inc.

PEORIA, ILLINOIS

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Eastern Division: 250 W. 54th Street, New York

Branches and service stations all over the world

City Council May Reserve Discretion to Choose Between Paving Materials

A paving ordinance was not vitiated by a provision for subsequent decision by the city council as to which of four different kinds of material—*asphaltic stone, asphaltic cement, plain asphalt or brick*—would be used, holds the Illinois Supreme Court in the case of *City of Olney vs. Baker*, 141 *Northeastern Reporter*, 750. However, this decision was influenced by the circumstance that the original resolution in the proceedings, as well as the preliminary estimates, plans and specifications, described each of the proposed methods in detail. The Court said:

"We know of no authority which prevents bids being received on several kinds of paving work, where the purpose for so doing is to bring about fair and really effective competition among bidders for the construction of the improvement contemplated. Some discretion must be left to officials in charge of the work to be done. Most public officials who are honest and fair in the dealings on behalf of a municipality know that two kinds of competition are very desirable in obtaining bids for paving, namely, competition between different kinds of paving, or those who are capable of laying the several kinds, and competition between bidders who are able to lay the same pavement."

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of
THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Recent Zoning Ordinances

In the latest bulletin of the Department of Commerce, Washington, D. C., referred to below, are listed the following zoning ordinances, not given in the previous bulletins of the Department, or in these Zoning Notes:

Pittsburg (1923), Stockton (1923), Whittier, Calif.; Framingham, Holyoke (1923), Mass.; Ann Arbor (1923), Mich.; Bayonne, Clifton (1921), West New York (1922), N. J.; Union Corners, Waverly, Wilmont, N. Y.; Petersburg (1922), Va.; Waukesha (1923), Wis.

A correction: Seattle, California, in the September, 1923, Notes, should read Seattle, Washington.

Recent Zoning Decision

NEW JERSEY—*Allen v. City of Paterson et al.*, Supreme Court, July 9, 1923, reported in 121 *Atlantic* 610.

Certiorari: The Board of Appeals of the city varied the requirements of the local ordinance requiring a garage to be built 14 feet from the street line by allowing it to be constructed in this case 7½ feet from that line, on the ground that the shape and size of the lot made the construction of a garage on the lot in compliance with the letter of the ordinance impossible. The New Jersey law provides that:

"The jurisdiction of the Board of Appeals shall be defined in such ordinance. But in no case shall the authority vested in such board extend beyond varying or modifying the provisions of said ordinance where the enforcement of its strict letter would work unnecessary hardship or injustice to property owners."

Held that under this law the Board had the power to vary the ordinance, in a case like this,

to prevent unnecessary hardship. The power to do so, in the absence of unreasonableness, fraud or *mala fides*, on its part, is not controllable by the courts. The action of the Board is therefore sustained.

Location of Telephone Exchanges

A conference of city planners, city officials and officers and experts of the Bell Telephone Company of Pennsylvania was held on December 14, 1923, at the office of the company, 261 North Broad Street, Philadelphia. The location of telephone exchanges, like the location of garages, is a zoning problem of great importance and difficulty. Like the garage, the telephone is a local necessity, and like the garage, it is often an alien structure in locations where the telephone company wishes to place it. A conference of the various parties interested in discovering the principles underlying the solution of this problem for the good of all concerned, is therefore a matter of interest to planners, city officials and telephone companies throughout the country. A record of the conference, consisting of a pamphlet of 100 pages, with an appendix of maps, diagrams, and tables and graphs of statistics, has been published by the Bell Company, entitled "Conference on Zoning as Affecting Telephone Problems."

Zoning Bulletin, Department of Commerce

The Department of Commerce at Washington, D. C., has just issued a zoning bulletin, dated January, 1924. It shows that zoning ordinances were at that date effective in 221 municipalities in the United States, 81 municipalities with a population of about 8,000,000 having adopted such ordinances during the year 1923. A complete list of zoned municipalities, and of zoning enabling acts is given.

Autocars have kept Washington spic and span for 14 years



4-cylinder 4 to 6 ton Autocar, 1200-gallon tank body, owned by the District of Columbia

IN 1909 the Executive Commissioners of the District of Columbia bought their first Autocar. Since that time they have placed many repeat orders for Autocars, and, recently have purchased two more 4-cylinder 2 to 3 ton models, and also a 2 ton Autocar Electric.

The 4 to 6 ton model pictured above is equipped with a 1200-gallon street flusher, which is worked on two eight-hour shifts a day. This truck flushes an

average of 135,000 square yards of pavement on the day shift and 190,000 square yards on the night shift.

Autocar motor trucks are a safe investment for public officials. The product of one of the oldest and largest motor truck factories, each Autocar is assured continuous and expert service attention by the nation wide system of Autocar Direct Factory Branches.

Capacities 1 to 6 tons; Chassis prices \$1100 to \$4800.

The Autocar Company

ESTABLISHED 1897

Ardmore, Pa.

Branches in 46 cities

Autocar

gas *and* electric trucks

EITHER OR BOTH - AS YOUR WORK REQUIRES

Hints, Helps and Happenings

Controlling the Mosquito

THE cartoon here reproduced is from the striking cover of a pamphlet on mosquito control issued by the Bureau of Sanitary Engineering of the Texas State Board of Health. From the same source can be secured "The Story of the Mosquito," for use in the schools, and a mimeographed "Chalk Talk" on mosquitoes, with charts to aid the lecturer.

Among other agencies doing particularly effective mosquito-control work, from which local communities can secure printed matter or aid, are the U. S. Department of Agriculture, the U. S. Public Health Service, and the New Jersey Agricultural Experiment Station (New Brunswick, N. J.).

Noise Nuisance Suggestions from Civic Club

THE Civic Club of Philadelphia, through its Joint Committee on the Noise Nuisance, of which Mrs. Imogen B. Oakley is Chairman, has suggested to Director Butler the following six ways by which the committee believes the unnecessary noise of the city can be decreased without detriment to any one and with a vast increase to the public comfort:

First, that heavy traffic shall be diverted from residential streets from 8 P. M. to 8 A. M., with especial consideration of Spruce and Pine Streets, which, being so near to Chestnut and Walnut Streets, are afflicted with their heavy traffic overflow.

Second, that one standardized horn shall be required on every motor vehicle, the siren and klaxon to be put under the ban of the law.

Third, that the law against the use of muffler cut-outs be strictly enforced.

Fourth, that drivers who sound their horns uselessly and continuously between intersections

and in traffic jams be subject to arrest and fine.

Fifth, that the law forbidding street vendors to call their wares in any part of the Commonwealth be strictly enforced. Hotel keepers make especial complaint against the cries of newsboys, which they report as excessively annoying to their guests.

Sixth, the Joint Committee on the Noise Nuisance believes that to add a gong to the proposed semaphore system would be a useless increase to the already large number of gongs which perplex and bewilder the pedestrian.

Preventing Dust Explosions in Industrial Plants

THE results of an investigation by state and Federal officials of the explosion at the plant of Corn Products Refining Company, Pekin, Ill., January 3, 1924, are given in a statement obtainable from John G. Gamber, State Fire Marshal of Illinois.

The explosion apparently originated from a fire caused by an overheated bearing in a conveyor box in the basement of one of the buildings, and at a time when one of the starch buggies or wagons was being dumped. The dust produced by the dumping of the wagon would

furnish a cloud to be ignited by the fire in the conveyor box in the basement and, in the opinion of the investigators, the first or primary explosion occurred at this point. Later the fire reached the packing machines in another building where a second and more violent explosion occurred, severely burning the men in this part of the building and causing extensive property damage.

In the opinion of the investigators, information of considerable value not obtained in the investigation of previous explosions of this character has been obtained, which will enable the





Protecting the Public Health

The importance of public health protection is shown by the special laws passed by many states endorsing sanitary drinking fountains in public parks, theatres, libraries, factories, offices, and private residences.

MUELLER Sanitary Drinking Fountains

do away with the unsightly public drinking cup—prevent possible contamination—insure quick and convenient service—give lasting satisfaction.

No. E-3632 above, one of the many Mueller designs, is especially adapted for use in public parks, because the galvanized iron stand enables small children to use it easily. Complete descriptions and prices upon request.

Mueller Co., Decatur, Illinois, U. S. A.

145-149 W. 30th St., New York; 1072-76 Howard St., San Francisco; 2468 Hunter St., Los Angeles

application of additional control measures for the prevention of these dust explosions in industrial plants throughout the world. The investigators recommend that operations in which dust is produced in large quantities should be separated from other operations in industrial plants of this character, and that such operations as starch dumping and packing should be carried on in separate buildings, remotely located from the other parts of the plant, and that these buildings should be of such construction as to afford the least resistance in case of explosion and not confine the pressure.

Regional Town Planning Progress in England

ONE of the most striking of the recent developments of town planning in England has been the voluntary combination of local authorities to form Joint Town Planning Committees for the purpose of planning, cooperatively, regions comprising an economic or geographical unit, in order that individual schemes may, to the mutual benefit of the several communities, form part of a large pattern of development, designed to meet the economic and social needs of the whole unit of common interest.

The following is a list of 22 Joint Town Planning Advisory Committees already established, set out in approximate order of formation:

Region	No. of Authorities	Approximate Acreage	Approximate Rateable Value £
Doncaster	8	108,160	1,250,000
Manchester	88	512,098	17,442,543
Deeside	9	67,550	491,500
S. Tees-side	7	38,800	1,000,000
W. Middlesex	19	73,410	2,600,000
S. Tyneside	10	47,735	1,836,746
N. Tyneside	14	137,000	3,400,000
Rotherham	5	63,540	700,000
Mansfield	9	100,000	624,000
Wirral	3	59,640	2,046,000
N. E. Surrey and W. Kent	13	83,644	3,631,186
Thames Valley	10	23,615	1,758,272
East Glamorgan	12	220,528	3,676,729
Lancaster and district	5	15,253	396,500
Mid Glamorgan	5	89,241	334,595
East Kent	14	150,657	1,438,921
Leeds and Bradford	39	231,068	7,809,081
Nottingham and district	13	171,918	2,196,684
Afan and Neath Valleys	4	93,731	502,433
Midland	40	255,072	11,872,742
North Tees	3	19,112	469,466
South Essex	5	74,823	705,576

The Doncaster, Deeside and North Tyneside Committees have agreed upon their reports, and those of the two first-named have been published, with reproductions of the plans. The Preliminary Report of the West Middlesex Joint Committee has also been published. In several other cases particular joint proposals have been agreed upon and are being carried out.

The representation of constituent councils varies considerably. For example, in some cases urban districts have two members each and the rural districts each one member; in others, representation varies in proportion to an ap-



THE SHADED AREAS ARE THOSE IN WHICH JOINT TOWN PLANNING COMMITTEES HAVE BEEN ESTABLISHED OR (IN THE CASE OF FIVE) RECOMMENDED

proximate mean of area, rateable value, and population. County councils cannot have voting members on Joint Town Planning Committees, but in most cases have appointed representatives to attend the meetings, accompanied by an official, and help with advice.

In respect to the following additional regions, conferences of representatives of the local authorities concerned have recommended that Joint Town Planning Committees should be established:

Region	No. of Authorities	Approximate Acreage	Approximate Rateable Value £
Monmouthshire	30	397,146	2,444,334
West Glamorgan and East Carmarthen	17	395,564	1,987,874
Halifax and Huddersfield	44	185,242	2,963,393
Bath and Bristol	16	410,510	3,932,392
Chesterfield	8	115,175	762,231

From a statement by G. L. Pepler (Past President) in the *Journal of the Town Planning Institute*, February, 1924.

Property Valuations and Tax Levies —a Ten-Year Comparison for the United States

IN a statement issued last month by the Department of Commerce, figures are given for each of the forty-eight states, compiled by the Bureau of the Census, showing the total assessed valuation of all property subject to general property taxes, and the total levies of general property taxes for 1922 in comparison

Harvard Street, Cambridge, Mass.
Tarvia-built 1907. Today, after seven-
teen years of traffic this street is in per-
fect condition.

*This Car?
Junked long since*



—but the street is still good

“17 years’ continuous service”— Tarvia roads endure

GONE are those old-time cars with their weird grunts and protesting snorts. One of them is pictured here. Seventeen years ago it used to startle the inhabitants of Cambridge, Mass. That was the year the Tarvia pavement was laid on Harvard Street—back in 1907.

Seventeen years have rolled by—seventeen years of unceasing motor traffic—yet the Tarvia pavement on Harvard Street is still in excellent condition.

Tarvia streets can be maintained indefinitely at little cost—only economical maintenance

is needed to make a Tarvia Pavement last indefinitely.

And in addition:

Tarvia pavements will not wave, roll or rut.

Tarvia pavements are skid-proof because of their granular surface.

Thousands of Tarvia streets and roads have proved to taxpayers that—

For the money spent—Tarvia gives more miles and the most years of satisfactory service.

Every paving requirement—construction, repair or maintenance—can be met with Tarvia.

Tarvia
For Road Construction
Repair and Maintenance

The *Barrett* Company

New York	Chicago	Philadelphia	Boston
St. Louis	Cleveland	Cincinnati	Pittsburgh
Detroit	Kansas City	Birmingham	Dallas
Minneapolis	Salt Lake City	Bethlehem	Lebanon
Youngstown	Milwaukee	Toledo	Columbus
Baltimore	Syracuse	New Orleans	Rochester

In Canada:
THE BARRETT COMPANY, Limited
Montreal Toronto Vancouver St. John, N. B.
Winnipeg Halifax, N. S.

with 1912. The basis of assessment has changed in some of the states during the ten-year period, and accounts in part for the large per cent of increase shown.

The general property tax is the common designation of the direct tax upon real property and upon other property which is apportioned and levied by substantially the methods employed in apportioning and levying taxes upon privately owned real property. The report gives the total levies of general property taxes, as thus defined, for the state governments, counties, cities, towns, villages, school districts, townships, drainage districts, and all other civil divisions having the power to levy taxes.

The totals and averages for the entire United States are as follows:

ASSESSED VALUATION OF PROPERTY		
	Total for U. S.	Average Per Person
1922.....	\$124,616,675,000	\$1,146.16
1912.....	69,452,936,000	715.48

LEVIES OF GENERAL PROPERTY TAXES			
	Total for U. S.	Average Per Person	Average Rate Per \$100 of Assessed Valuation
1922.....	\$3,502,941,000	\$32.22	\$2.81
1912.....	1,349,841,000	13.91	1.94

The increase in assessed valuation in the ten-year period was 79 per cent, and the increase in total taxes levied during the same period was 160 per cent; but the average rate per \$100 of assessed valuation increased only 45 per cent.

Restriction of Outdoor Advertising

TO urge the confinement of outdoor advertising to commercial locations, where it will not injure scenery, civic beauty or residential values, is the purpose of the recently organized National Committee for Restriction of Outdoor Advertising, of which Mrs. W. L. Lawton, of Glens Falls, N. Y., is chairman. Membership in the Committee is open to all organizations interested in this work.

In outlining the purpose and spirit of the campaign, the Committee says:

"We believe that most of the national advertisers, when they realize how this form of advertising is ruining the beauty of our country and arousing the resentment of the people, will gladly cooperate with us.

"We are distinctly opposed to boycotting.

"Our aim is to arouse the public opinion already existing against out-of-place signboards, vocalize that opinion, and express it directly to the advertiser.

"In response to the local Glens Falls campaign, several national advertisers have agreed to keep their display advertising off the Lake George Highway. They at once ordered their posters off the road, and will discontinue their painted bulletins as fast as they expire."

The growing sentiment among national advertisers against bill-boards which destroy the beauty or add to the danger of highway travel, had striking testimony in an announcement on

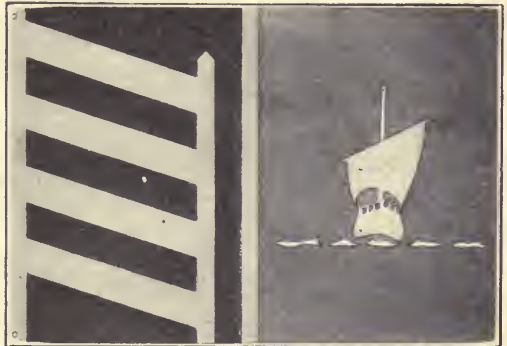
March 24 by the Standard Oil Company of New York, of its intention to abandon all highway bill-boards where they are objectionable or mar the scenic effect. Herbert L. Pratt, President, said that the company would confine itself to boards at garages and service stations, and that the removal of the last sign was expected within eighteen months, when the last contract had expired.

"It is the desire of the management of this company," said President Pratt, "to cooperate in every way with the various civic organizations and women's clubs in its territory, which are seeking to improve the natural beauties of the highways."

City Flag Combines Welcome and Warning

A WELCOME to visitors and new residents, and a reminder of the great fire of 1922, are combined in the official flag and slogan recently adopted by the city of Astoria, Ore.

The boundary line between the states of Washington and Oregon is formed largely by the Columbia River, at the mouth of which Astoria is located. Some hundred miles inland, railroads and state highways line both banks of the river. It was appropriate, therefore,



ASTORIA'S NEW CITY FLAG

that the City Council should adopt as the city's slogan, "The Gateway to the Northwest."

The municipal flag, designed by O. A. Kratz, City Manager, is symbolic of the city's slogan and commercial resources. The white bars at the left represent an open gate or gateway, a sign of welcome. They are on a red field, commemorating the fire of December 8, 1922, which destroyed the entire business district of the city. The right half of the flag shows a white ship on a blue background, representing Astoria's marine industry—fishing and shipping.

RURAL SCHOOLS AND COMMUNITY ORGANIZATION

The consolidated school, through its clientele of teachers, pupils, and patrons, furnishes the best basis possessed by many rural communities for the complete organization of community interest.

—Augustus W. Hayes.



"Economical"

"Our Best 'Sixty' has revolutionized our cost of road construction and maintenance," writes the engineer of a Colorado County where the Best has been used for pulling scrapers, elevating grader, scarifier and snow plows. "In fact, it has never failed in anything we have asked it to do and has been very economical both as to repairs and operation."

*Factory Branch—
Warehouse*
St. Louis, Missouri

SALES OFFICES

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Investigation of the work of Best "Sixties" and "Thirties" on any job will prove worth your while. A list of owners will be sent on request.

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SAN LEANDRO, CALIFORNIA

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BEST TRACTORS

A New Incentive for Acquiring Land for Playgrounds

THE Harmon Foundation has just announced on behalf of its founder, William E. Harmon, an offer to secure and present during the current year fifty playground sites to growing towns, small cities, and suburbs of larger cities with at least 3,000 population which have grown at least 30 per cent since 1900. All applications to participate in this gift must be endorsed by the mayor of the town or president of the school board and must be received not later than July 1, 1924, by the Division of Playgrounds, Harmon Foundation, Inc., 140 Nassau Street, New York, N. Y.

Not more than \$2,000 will be available for any one town and in no case will less than two acres of land be purchased. This obviously eliminates from consideration a large number of valuable and much needed play sites. It is the desire of the Foundation, however, to use the limited funds at its disposal to encourage play land acquisition in growing towns where the need is not yet acute and yet where such land will eventually be in great demand.

The formal application blank will be sent upon written request to the Foundation, and provides for a proper appraisal of the land, resolution on the part of the city officials to equip and maintain the playfield adequately, evidence that the title is clear or can be made so before the taking of title, and evidence that an option can be secured for a sufficient length of time to complete arrangements for the purchase.

Examination, choice of sites and securing of titles will begin immediately on the close of the offer, but, judging from the experience of giving eleven playgrounds in Ohio during 1923, it is expected that the remainder of the year 1924 will be consumed in concluding transactions and delivering titles.

Aids for Better Homes Week, May 11-18

UNDER the leadership of Better Homes in America, an educational, non-commercial corporation recently formed, with Herbert Hoover as President and Dr. James Ford, now on leave of absence from Harvard University, as Executive Director, plans are going forward for a nation-wide observance of the week of May 11-18 as Better Homes Week.

One definite objective will be the inclusion in high school curricula of required courses in home-making and the care of a home. The one sure product of every school is an army of men and women who will head homes, yet for this most important function in life there is often not even a pretense of practical training. A host of simple but collectively important ways to improve small homes are being recommended by the group behind the new organization, who aided informally in the setting up of approximately 1,000 Better Homes exhibits in 1923.

Here are some of the prosaic bits of advice: Put the kitchen sink under a window so that

the home-maker may enjoy the fresh air and the beauty of nature while engaged at necessary household tasks.

Put rollers on the kitchen table and save about fifteen miles of walking a month for the housewife.

Place your bed in relation to the bedroom windows so that you can have plenty of fresh air without a draft.

Dedicate the sunny south bedroom to your children instead of to occasional guests.

Build your house so that the living-room and dining-room constitute one big room. Then your daughter can have dances, parties and other social events at home instead of somewhere else.

Give the housewife the share of the living expense money which should come under her jurisdiction, and let her be responsible for the budgeting of it.

There are scores of further recommendations. Books, music and other cultural features of the home are included in the specifications, as well as things physical. A determined effort will be made to see that every American knows what constitutes the best, most livable home his money can assure. The headquarters of Better Homes in America, from which local committees can secure printed matter and other aids are at 1653 Pennsylvania Avenue, Washington, D. C.

A New Public Service Building for Pittsburgh

OPERATION headquarters for almost all the public utilities of the city will be accommodated in the new Public Service Building now under construction in Pittsburgh. The new structure, with a frontage of 85 feet on Sixth Avenue and extending 240 feet along William Penn Way, will house the activities of the Philadelphia Company, Equitable Gas Company, Duquesne Light Company, Pittsburgh Railways, Allegheny County Steam Heating Company, and various other affiliated corporations.

An important street improvement will accompany the erection of the building—the widening of William Penn Way to 50 feet, through to Seventh Avenue, thus giving the structure a frontage on a wide thoroughfare which will be the automobile highway across town between Grant and Smithfield Streets. Among the many modern features of this new Public Service Building will be an auditorium with about 700 seats for meetings of interest to the employees, for various events of the employees' organizations and gatherings of a similar nature.

Effective Aid Available for Municipal Health Departments

THE Committee on Municipal Health Department Practice of the American Public Health Association is now prepared to offer to the larger cities of the country the services of its Field Director, Dr. W. S. Ran-

Makes Your Ford A Two-Ton Truck

Six Speeds for Your Ford

Two-ton ruggedness is built into the Ford truck.

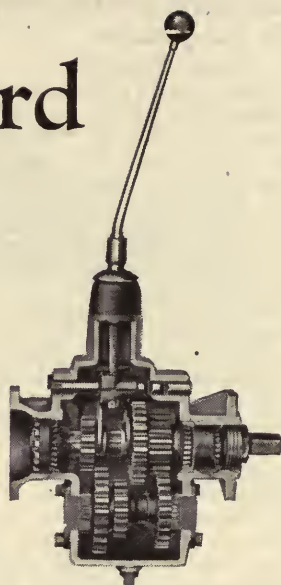
Two-ton power is supplied by the famous Ford engine.

The Warford Auxiliary Transmission forges the link between the two, which makes the Ford truck a distinctively economical two-ton haulage unit.

The Warford-equipped Ford, with a speed for every condition of road and load, hauls with the best of them through heavy going and passes the rest of them on good roads.

Warford couples bull-dog strength and speedwagon fleetness with Ford dependability and economy.

If your Ford dealer hasn't the Warford transmission, write for our dealer list.



What the Warford Is and What It Does

The Warford Auxiliary Transmission is a high-grade gear shift of the approved sliding gear selective type which gives the Ford six speeds forward and three reverse.

The Warford transforms engine revolutions into rear axle torque at six different ratios, from 36 to 1 in low, to 5 to 1 in high, allowing the engine to run at normal speed whether the truck is traveling one mile an hour or thirty.

In adapting normal engine speed both to heavy hauling and high speed, the Warford saves wear and tear, loss of power and waste of gas and oil, caused by the racing motor.

Warford

AUXILIARY TRANSMISSION

The Warford Corporation, 44 Whitehall Street, New York

kin, as a consultant on health department organization and practices.

Dr. Rankin is in possession of an immense amount of information which the Committee on Municipal Health Department Practice has collected during the last three years. He also knows the opinions of the Committee with reference to various phases of the municipal health problem, and—what is of even greater importance—is familiar by first-hand contacts with city health officials and with their ideas and methods of work. The Committee believes that, through this clearing-house service which its Field Director is rapidly developing, the Association is now in a position to be of very definite help to cities that may desire to know what other cities are doing and what measure of results they are obtaining in municipal health department practice.

Full details can be secured from Homer N. Calver, General Secretary, American Public Health Association, 370 Seventh Avenue, New York.

A New Town in Canada

THE town of Jasper, which is the administrative center of the largest of Canada's national parks, lies on a gravelly bench about two miles long and half a mile wide and approximately 60 feet above the river. To the north and west there is a steep hill two or three hundred feet high, and beyond this there is a rolling plateau about two miles in width. On the north this plateau commences below a shoulder of Pyramid Mountain, reaching eastward toward the railway. From here it extends southward and, swinging to the west above Jasper, parallels the valley of the Miette for about ten miles. One of the most noticeable features of this plateau is the number of small lakes and ponds scattered over it, many of

which are well stocked with fish. Chief among these are Pyramid, Patricia, Cabin, and Caledonia Lakes. On the opposite side of the river there is a wide flat extending north beyond Maligne River. On this flat there are also a number of very attractive lakes, the more important ones being Beauvert, Annette and Edith Lakes.

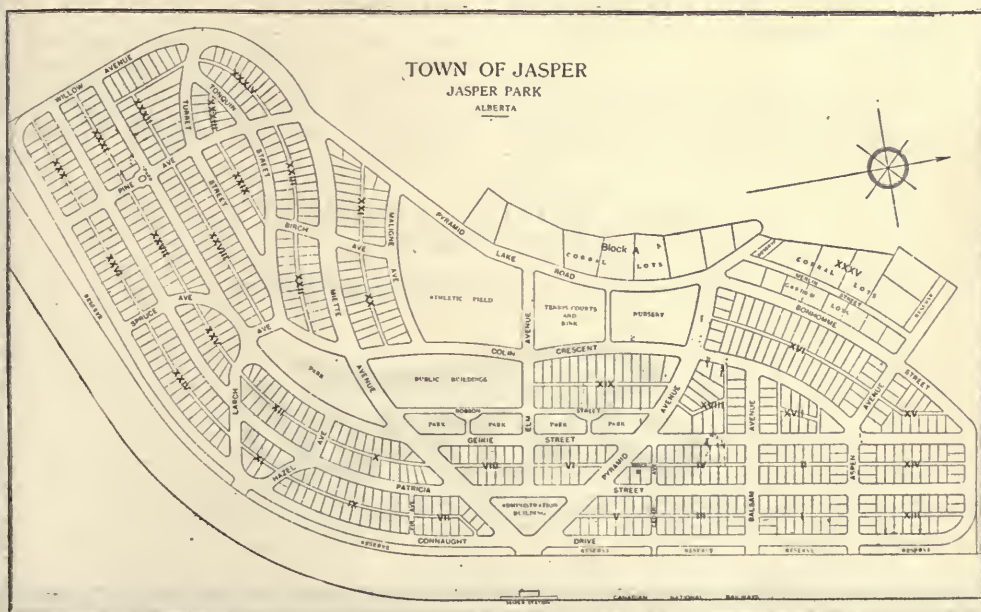
The plan of the town was made by Thomas Adams in consultation with Dr. E. G. Deville. Jasper is now a well-built-up and flourishing community. A reproduction of the plan is here presented.

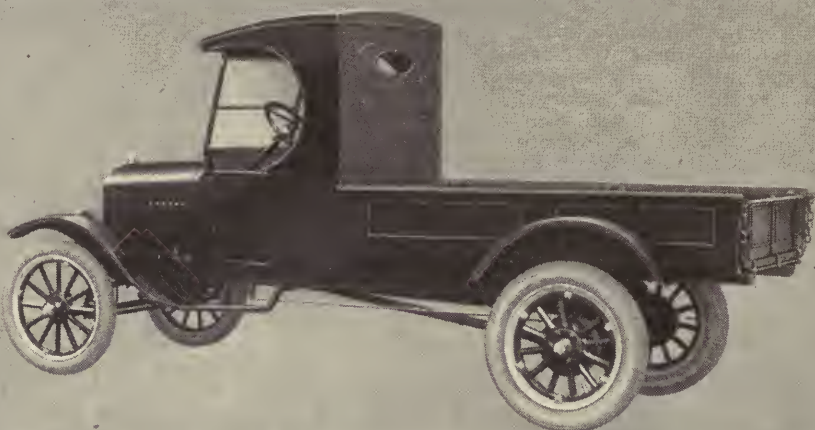
—From *The Journal* of the Town Planning Institute of Canada.

Three-Day School for City Officials

THE University of Kansas announces an exceptional program for its third annual three-day school for city officials, to be held at Lawrence, April 15-17. The most important new feature will be the actual laboratory work done by those attending the school. In the bacteriological laboratory, media will be provided the first day, and each one will plant at least one sample of water. Readings will be made and the analyses completed the second and third days. In the chemical laboratory, tests will be made to determine the temporary and permanent hardness of various waters, also tests for iron, salt and other chemicals. Another new feature of the school this year will be the use of moving picture films illustrating various phases of the work.

Special attention is to be given to problems of water superintendents and commissioners. Methods of computing rates, fire insurance requirements, the adaptability of different kinds of pumps, water purification, sewage disposal,





The new Ford all-steel body and weather-proof cab mounted on the Ford worm drive chassis at \$490 f. o. b. Detroit, is the world's lowest priced complete one-ton truck.

A Preference Based on Quality

There is deep significance in the fact that 78% of all the trucks of one ton or less capacity in the United States are Fords. This overwhelming preference for Ford haulage units has its basis in the low cost of Ford transportation, the rugged construction of the truck itself, and its unusual adaptability to every line of industry.

Mechanical excellence, simplicity of design and ample power are further factors that have contributed to the popularity of the Ford One-Ton Worm Drive Truck.

As a logical step in providing dependable transportation at the lowest possible cost, the Ford Motor Company is now producing an all-steel body and steel weather-proof cab mounted on the Ford Truck Chassis, selling at the remarkably low price of \$490.

Merchants standardizing their delivery systems on Ford One-Ton Trucks have available the facilities and assistance of over 33,000 Authorized Ford Service Stations, conveniently located to their business.

FORD MOTOR COMPANY

Detroit, Michigan

See the Nearest Authorized Ford Dealer

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and the treatment of industrial wastes will be discussed in non-technical language.

Any municipal official or employee in Kansas may attend the school without registration or tuition fee.

Orientation of Baseball Fields

AS engineers on a park for the borough of Vandergrift, Pa., Blum, Weldin & Company, of Pittsburgh, secured information as to the orientation of various baseball fields throughout the eastern end of the United States.

Believing that some of this information will be of value to readers of THE AMERICAN CITY, it has been made available in the accompanying chart, in sending which Louis P. Blum writes:

"This drawing shows the meridian as it exists upon some of the National League ball diamonds and also upon certain diamonds laid out by various town planners. To the right of the chart is shown the direction of the sun's rays at 7 P. M. of August 1, the time when the twilight sun is most troublesome to ball players. The sun's azimuth at that hour was obtained from the Director of the Allegheny Observatory.

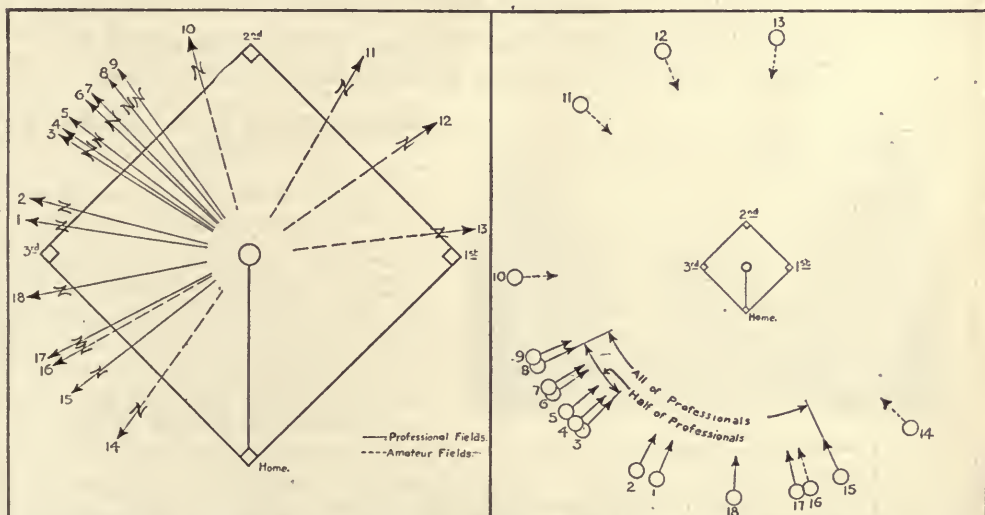
"There seems to be no set rule for the orientation of baseball diamonds, each one apparently being laid out to conform to the available area, to the most advantageous position of entrances and exits, to the best relation to grand stands and to various other factors which might rule

any individual case. It is noticeable, however, that all the professional baseball fields are laid out with the meridian practically in the one-quarter, or in such a position that the sun favors the batter and is most troublesome to the right fielder and first baseman, these players being the ones who ordinarily receive fewest batted balls. This arrangement also agrees with the opinions of several authorities whom we consulted."

A letter to Blum, Weldin & Company from the American Sports Publishing Company is quoted as follows:

"It is the custom at baseball parks where there are to be paid admissions to lay out the ground so that the high-priced seats shall be in the shadow in the afternoon. This usually results in the pitcher's throwing the ball to the west and puts the left fielder and the center fielder in the sun. Sometimes a park is laid out to accommodate itself to the street-car lines, and then little heed is paid to the spectators. They sit in the sun.

"The ideal way for play is to have the home plate in such a position that the batter is out of the sun and the pitcher throwing the ball across the sun. Some one will have to face the sun on any ball field. It is better to have a sun outfield than a sun infield. That is really the plan on which to go. Adapt your ground the best way you can to use all of it to good advantage, but take care of the infield as much as possible."



DIRECTION OF MERIDIAN IN VARIOUS
BASEBALL FIELDS

DIRECTION OF SUN'S RAYS, AUGUST 1,
AT 7 P. M.

- | | | |
|---|---|---|
| 1. New York, Yankee Stadium | 8. Chicago, National League | 14. Pittsburgh, North End (Amateur) |
| 2. St. Louis, American and National Leagues | 9. Vandergrift, Pa., Adopted by Borough Council | 15. Washington, American League |
| 3. Philadelphia, National League | 10. Cambridge, Mass., Harvard University | 16. Pittsburgh, North Side Board of Trade |
| 4. Philadelphia, American League | 11. Lewiston, Pa., Dickson Field | 17. New York, Polo Grounds |
| 5. New York, Ebbets Field | 12. Millvale, Pa. (Amateur) | 18. Pittsburgh, National League |
| 6. Cleveland, National League | 13. Bellevue, Pa. (Amateur) | |
| 7. Chicago, American League | | |

Safeguard the City's Buildings, the Grounds and the Children with a Stewart Chainlink Protection Fence.



STYLE NO. OT266—All Galvanized

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THE advanced ideas in construction of the Stewart type of Chainlink Protection fence makes it the ideal fence for municipal water works, sewage disposal plants, parks, playgrounds, golf courses, tennis courts. Made of genuine open-hearth galvanized fabric with interlocking mesh; fittings of pressed or forged steel, it combines protection with beauty and permanence.

We also manufacture Balcony Railings, Grilles, Wire and Iron Window Guards, Bridge Railings, Miscellaneous Wire and Iron Work.



Ornamental Iron Fence and Gates

For forty years we have been leaders in the manufacture of iron fence; hundreds of city and municipal cemeteries are among our thousands of installations. Stewart's Iron Fence and Gates are equally popular for town houses, suburban homes, country estates, and other properties where the highest type of enclosure or entrance gateway is required.

SAVE MONEY FOR THE CITY BY GETTING OUR PRICES ON PARK SETTEES.

Let us know your requirements in either Iron or Chainlink Wire Fence and we will submit designs and estimates of cost

THE STEWART IRON WORKS COMPANY.
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Employment Statistics for Cities

SOCIAL workers and others have urged the necessity for providing, in the development of employment, statistics for the publication of data by cities. Employment conditions differ widely between cities, and figures for entire states or larger areas are of comparatively little use for indicating changes in trends in particular cities.

The following list shows the cities in the United States and Canada for which monthly employment statistics based on employers' payroll reports are now being made available, and the agencies publishing the figures:

Cleveland Chamber of Commerce: Cleveland
Detroit Employers' Association: Detroit
Illinois Department of Labor: Chicago, Aurora, Bloomington, Cicero, Danville, Decatur, East St. Louis, Joliet, Moline, Peoria, Quincy, Rockford, Rock Island, Springfield

Massachusetts Department of Labor and Industries: Boston, Brockton, Cambridge, Fall River, Fitchburg, Haverhill, Holyoke, Lawrence, Lowell, Lynn, New Bedford, Peabody, Springfield, Taunton, Worcester

Canadian Bureau of Statistics: Montreal, Toronto, Ottawa, Hamilton, Winnipeg, Vancouver

The Federal Reserve Bank of Philadelphia has recently published monthly employment statistics for twenty-two cities in the Third Federal Reserve District. The bank has now, in cooperation with the three state departments of labor, extended the collection of employment statistics to cover all of Pennsylvania, New Jersey and Delaware.

The New York Department of Labor is now preparing to extend its analysis of local employment trends, and within a few months it will make available separate figures for the following industrial centers: New York City, Albany (including Schenectady and Troy), Utica, Syracuse, Rochester, Buffalo, Binghamton.

—From *The Compass* (monthly bulletin of the American Association of Social Workers).

The Function of One-Way Streets

THERE seems to be a good deal of misunderstanding about the function of one-way streets. This method was originally designed to increase the capacity of narrow roadways where the width was not right for an even number of traffic lanes—two, four, or six lines of traffic. In such cases, one-way operation brought more effective use of the given roadway by securing an extra lane or odd number—three, five—in the desired directions. One-way operation was not originally intended to be applicable to wide streets suited to the requisite number of traffic lanes in two directions. Especially is this the case where the distribution of traffic streets is uneven, making necessary long detours to move in the desired direction. One-way streets likewise tend to concentrate movement in the morning at one series of points and then in the evening at another, instead of distributing traffic at all

times. The system is clearly a makeshift—not a cure, and must be applied with extra precaution or the congestion it sought to avoid will simply be transferred to another point.

—From "Memorandum on Traffic and Transportation, District of Columbia," to the Senate Committee on Traffic Inquiry, November 19, 1923, by J. Rowland Bibbins, consulting engineer, Washington, D. C.

The Tumor on the City

COMMUNITIES which think only of growing bigger are looking at only one side of community life and development—and perhaps not the most important side either—the workers in the field of rural social organization at the State Agricultural College at Ithaca point out in calling attention to an article by Dr. David D. Vaughan of Boston University. In the article, Dr. Vaughan first asks if one can estimate the worth of a man by his size, if one can estimate the man's value to society by the scales? "If a man developed a fifty-pound tumor would he boast of it?" continues the writer. "Some towns are foolish enough to boast of increasing population when the citizens added are a liability instead of an asset. They may offer an opportunity for missionary work and for Americanization classes, and they may furnish occasion for careful planning by religious and educational leaders, but often they are hardly a basis for flamboyant boasting. The size of a city may be increased by a slum population, but not the real worth of the city.

—*State Service* (New York).

Arrests in South Bend—A Seven-Year Comparison

To the Editor of THE AMERICAN CITY:

The following report of arrests made in the city of South Bend for the year 1923 in comparison with those of the six previous years may be of interest to the readers of THE AMERICAN CITY:

Year	Total Arrests	Drunks
1917.....	3,835	1,804
1918.....	2,441	492
1919.....	1,715	171
1920.....	1,911	227
1921.....	2,681	495
1922.....	5,419	1,506
1923.....	6,903	2,096

You will notice the great increase in the total number of arrests and in the number of arrests for intoxication for the years 1922 and 1923. The conclusion might be drawn from these figures that lawlessness and intoxication are increasing in this city, but the correct deduction to be drawn from them is that a reorganized and revitalized Police Department has been on the job.

ELI F. SEEBIRT,
Mayor, South Bend, Ind.

EDUCATION FOR HEALTH

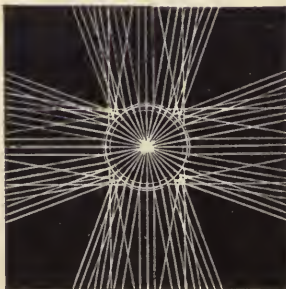
will help to solve the problems of social hygiene. The creation of fear through the exploitation of disease will accomplish little or no permanent results for good.—*Bulletin of Division of Health, Dayton, Ohio.*

A properly engineered street lighting system using these new refractors will effect savings over contemporary practice which are truly remarkable. These savings will most properly be applied to the purchase of more light, and the additional light will be used with the same high degree of efficiency, which made its purchase possible. The result may well be almost revolutionary in character—a tremendous step forward toward the goal of making all of the streets of all our cities as safe and convenient by night as by day.

From Holophane Bulletin No. 357 issued February, 1924, on the subject of 4-Way and 2-Way refractors.

Nearly every city in the United States is still far from the ideal of fully adequate street illumination throughout the entire city. The new Holophane 4-Way and 2-Way Refractors make this ideal attainable at a lesser increase over present costs than would otherwise be possible.

More light on the street for the same money—that is the obvious advantage of the new equipment; but a careful analysis of the cost of street lighting service shows *two other distinct and important gains*. Holophane Bulletin No. 357 just off the press tells you about them. Write for your copy.



Horizontal Section Showing the Action of the Vertical Prisms of the Holophane 4-Way Refractor.

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DIRECTS LIGHT SCIENTIFICALLY

WARNING—Spring Floods May Contaminate Water-Supplies

UNDER this heading the New York State Department of Health in its *Health News* for March 10, 1924, issues the following timely suggestions for water-works officials: "Water-works officials should be on their guard at this season of the year against the danger of contamination of water-supplies during freshets and flood conditions.

"Floods in water-supply streams may soon be brought about by spring rains and melting snow and ice. During these flood periods the contamination of streams is relatively more serious than at seasons of low flow. Accumulations of filth and washings from animal enclosures, privy vaults and cesspools will be carried by surface wash into the watercourses. Rapid stream flow will carry such contamination to water-supply intakes comparatively quickly, and consequently the danger of contamination is correspondingly greater, especially if the reservoirs are low or nearly empty. In the case of ground water-supplies unusual hydrostatic conditions may bring about contamination of springs or wells unless precautions are taken to guard against such pollution.

"It is therefore urged that water-works officials make every effort to minimize and prevent the contamination of their supplies. Watersheds should be carefully inspected and, if possible, premises thereon placed in such sanitary condition as to preclude the entrance

of infected material into the streams. Water purification plants should be carefully looked over and placed in perfect condition in order that they may be ready to meet the extra burden during periods of turbid and possibly infected water.

"Should there arise any question as to proper measures for adequately protecting the sanitary quality of any water-supply [in New York State], this Department should be notified at once in order that it may render such assistance as lies within its resources, either in the matter of advice or in the installation of emergency sterilization plants."

Kansas City Elects Commission Pledged to Council-Manager Form

AT a special election held in Kansas City, Mo., February 26, a charter commission was elected pledged in advance of election to draft a council-manager charter embodying the principles outlined in the item on page 217 of *THE AMERICAN CITY* for February, 1924. The Chamber of Commerce was one of the first organizations to endorse the movement for a new charter and has been very active in the campaign since its inception about eighteen months ago. The movement had the backing of most of the civic organizations and the Central Labor Union. Although the charter commission has a year in which to finish the drafting of the charter and to submit it to the voters, it has already effected an organization and is getting down to the work of charter drafting.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

THE month of March was a slow one for the municipal bond market. During the early part of the month there were an unusually small number of municipalities in the market for funds. The largest offering of the month which is scheduled at a date later than the time of this writing is a \$10,000,000 block of Soldiers' Bonus bonds of the state of Illinois. These bonds will bear $4\frac{1}{2}$ per cent interest and mature over a period of twenty years. This state has already sold \$40,000,000 of the total authorized issue, which is \$55,000,000.

The state of California is offering on the same day \$4,000,000 of its authorized \$10,000,000 Soldiers' Bonus bonds. These bonds will also bear interest at the rate of $4\frac{1}{2}$ per cent.

The entire market is looking forward to the New York State Soldiers' Bonus offering, which is scheduled for April 8. There are \$45,000,000 of these bonds, which will bear $4\frac{3}{4}$ per cent interest and mature serially in 1 to 25 years. Long-term New York State bonds have recently been selling on a 4 per cent basis. At present, it seems as though dealers will be able to handle this large issue at a fair profit.

With Congress apparently in no disposition to materially reduce tax rates, tax-exempt state and municipal bond prices are firm. Experts express the belief that this class of securities has in recent months discounted adoption of the Mellon surtax rates and, if that schedule is voted against in Congress, tax-free bonds should enjoy a renewed demand among wealthy private investors. At the moment, however, the bond business is unusually inactive and will probably continue so until uncertainty regarding tax legislation is removed.

IMPORTANT SALES DURING MARCH

Amount	Borrower	Maturity	Coupon Rate (%)	Net Yield (%)
\$ 540,000	Hartford Co., Conn.	1925-44	$4\frac{1}{2}$	4.06
1,000,000	Northampton Co., Pa.	1934-54	$4\frac{1}{2}$	4.22
500,000	Denver, Colo.	1934-38	$4\frac{1}{2}$	4.41
725,000	Atlantic City, N. J.	1925-64	$4\frac{3}{4}$	4.63
2,000,000	Dallas, Tex.	1925-64	$4\frac{1}{2}$	4.64
750,000	Flint, Mich., Union School District	1924-54	$4\frac{3}{4}$	4.68
800,000	Canton, O.	1925-48	5	4.81
655,000	Chattanooga, Tenn.	1928-37 & 1954	5	4.83
950,000	Black Hawk Co., Ia.	1927-39	5	4.97
634,000	Miami Beach, Fla.	1926-41	$5\frac{1}{2}$	5.37



Less
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2¢
per
mile

SPOKANE COUNTY, WASHINGTON, reports that each of the above four Harley-Davidsons has been driven 20,000 miles and that "the total operating cost has been less than two cents per mile, including depreciation."

Over 1500 cities, towns and counties use Harley-Davidsons for police service. For pursuing motorized crooks and "booze-runners," for enforcing speed and traffic laws, and for a variety of service duties, the Harley-Davidson is the most efficient, dependable and economical mount known—universally recognized as "America's Police Motorcycle."

Lightweight alloy pistons—smoother power—less vibration. Alemite lubrication—first on any motorcycle. Full-floating sidecar—49-inch semi-elliptic springs. Handsome olive green finish, maroon striped.

Your city needs motorcycle protection this coming Summer. Now is the time to get the facts. Write for free, special literature on Police Motorcycles. Or, see your local dealer.

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Dept. M.

Milwaukee, Wis.

Harley-Davidson

The Motorcycle

From the International Union of Cities

City Smoke and Infant Mortality. 61.471.5 - 413.2 (42)

A bulletin of "the International Society for the Protection of Children" calls attention to the fact that the rate of mortality due to maladies of the respiratory organs is much greater in cities where there is much smoke, as Manchester and Sheffield in England. At Leeds, after six days of thick fog, infantile deaths rose from 50 to 175. A deputation representing eleven organizations devoted to the protection of health and the bettering of social conditions, has submitted to the Ministry of Health its views concerning the danger arising from excessively bad smoke conditions in English cities.

Housing Colonies for Families with Children, Belgium. 71.43 (493.1)

The movement for better housing at Anderlecht was begun in 1907. It devoted its efforts and its resources (very slight up to 1920) to the improvement of old or the construction of new lodgings, 120 having been built up to that date, under the Belgium law of 1889. In 1920, upon the formation of the Société Nationale des Habitations à Bon Marché, the Anderlecht movement joined this national organization, and under the effective guidance of Mr. Melckmans, its energetic president, with grants from the above-mentioned national society, the local society has now undertaken the construction of 1,350 houses, arranged in two garden suburb groups, on the outskirts of Anderlecht, an important district of Greater Brussels. The two tracts together have an area of about 75 acres. The houses are mostly single-family row houses, and have been reserved for families having at least three children.

Ring Road and Other Street Work, Sheffield, England. 71.5 (42.74)

An important new system of main highways has recently been built at Sheffield. These aggregate 10 miles in length and are from 80 to 100 feet in width. An important feature of the project is a "Ring Road" surrounding the city. The entire work has cost the community approximately £275,000. The projects have been undertaken for the purpose of furnishing work to the unemployed.

Unusual Bathing Pool Construction for Tynemouth, England. 61.347 (42.82)

The city of Tynemouth, as its name indicates, on the ocean near the mouth of the river, has recently completed a new public bathing pool, which is to be emptied and refilled automatically without pumps, at low and high tides. There are to be seats for spectators. The estimated cost is £70,000.

A Museum to Aid Housing and Town Planning in Austria. 71.43 (43.6) (074)

An effort is being made by the Austrian Union for the Development of Housing Colonies, to found a museum which will include city planning, housing and allied subjects. An appeal has been made for funds, as well as for models, reproductions, plans, books, samples of material, etc. The purpose of this museum is to be educational and to show all classes of the people the significance and importance of housing colonies, from the points of view of economy and of social and intellectual phases. Traveling exhibits will be sent about into towns and villages, including selections from the material collected in the museum. Furthermore, they hope to give in the schools, lectures illustrated by lantern slides and films. The extraordinary interest that the public has shown this year in the exhibits already made, not only in Vienna, but in the Federated States, justifies the belief in the value of such a permanent museum.

Parks and Open Spaces, Milan, Italy. 71.6 (45.21)

Engineer P. Mezzanotte has made an appeal to the Engineering College of Milan, strongly urging that the speculative builder be prevented from covering with apartment houses and other structures the little that remains of the open land in the central portion of the city of Milan, and also urging the preservation of the few private gardens which still remain in that city, already too densely crowded. A similar problem exists in most modern cities. It is here proposed to indemnify or reimburse the proprietors of such gardens and open spaces for holding them free of building. A means of accomplishing this is to be found in the preferential application of building regulations and ordinances.

Housing and City Planning in England. 33.332 + 71 (42)

Many local activities are going on along these lines in various parts of England. The city of Brighton has just submitted to the Ministry of Health (the controlling governmental authority in such matters) a project for the acquisition of recreation grounds for children and adults, with the request for permission to borrow money for the grading of the land. The City Council of Halifax has just approved the submission of a request for permission to construct 73 houses at a total cost of £38,000. Northampton has just taken the same step in regard to the construction of 102 houses to cost 45,000 pounds. At Sheffield, a credit of £10,000 has been voted for the purpose of installing electric lighting systems in workmen's

THE AMERICAN CITY

HOLLOWSPUN

LIGHTING STANDARDS



An Asset by Day as Well as by Night.

THE North Shore Park Board in Chicago had estimates on the cost of lighting a section of boulevard to the standard followed in previous park and boulevard lighting in the city. This system had little to recommend it from the standpoint of light distribution, permanence or day time appearance.

Investigation showed that a modern system providing 70% more light at the street surface, and using Hollowspun reinforced concrete standards—permanent and pleasing in architectural design—could be installed for less money.

This installation is attracting wide-spread attention, both for its night time efficiency and its day time appearance. Full details in "Hollowspun Standard" No. 11.

MASSEY CONCRETE PRODUCTS CORPORATION
Peoples Gas Building Chicago

homes. The delegates from 44 communities in the vicinity of Halifax have agreed to the formation of a regional committee to study the plan of this entire district, not wholly for the immediate execution of the work, but with the broad purpose of securing greater economy and better future developments. The city of Wigan has decided to prepare a city plan.

A Thames Boulevard Near Chiswick, Eng.
71.6 (42.1)

Chiswick, a suburb to the west of London, was in a fair way of becoming an industrial center, but the local authorities, preferring to preserve its rural character, have set aside fine, broad open spaces, along the Thames River. Plans for the development of this great area into a boulevard and parks are now being prepared by experts.

Housing Crisis in Germany. 33.332 (43)

Four proposals have recently been formulated to help solve the housing crisis in Germany. The first suggests building operations to be conducted by individuals. By this means it is believed the cost of construction should be reduced to a reasonable price. The second method would provide that in each community the economic organizations, industrial, commercial, etc., should be placed under obligation to build. The third method suggests a special tax on unmarried and young men as a means of benefiting the housing situation. The fourth provides for housing construction based upon supplementary or overtime voluntary work of employees and workmen. To these should be added the proposal of ceding lands at reduced prices by the State, preferably by what is known as *emphyteusis*—an ancient form of contract, to improve lands and thereby gain practical possession.

Housing in Austria. 33.332 (43.6)

Extensive building operations are being undertaken by the city government of Vienna, which has decided to construct annually during the next five years, through the expenditure of 400 million crowns, 25,000 houses, as well as a corresponding number of industrial establishments. These new houses, it is expected, will in five years make up the present housing shortage. The 400 million crowns required will be obtained, not by loans, but by regular municipal receipts from taxation and other sources.

House Rents, Holland. 34.743.33 (492)

Rents demanded for houses constructed from subsidies of the Dutch Government, it is claimed, are too high, not only with reference to the earning capacity of the occupants, but also as compared with the "norm" established by the Department of Labor. At present the rents amount to from one-fifth to one-fourth or even one-third of the wages of the occupant, while the "norm" above referred to is only one-seventh or one-sixth. A thorough inquiry

has been made on the subject by a political association, and an urgent request made to all building associations that they aid the movement to the extent, at least, of filling out the questionnaire sent them in order that action may be addressed to Parliament urging a revision of the present Government policy.

Slum Removal, Manchester, England.
61.358 (45.72)

The Ministry of Health has just approved a project for Manchester, England, which involves the demolition of an entire street (199 houses). The occupants will be rehoused in new lodgings. The cleared land will be rearranged to provide for open spaces and for commercial and industrial structures.

Housing and Public Health in Italy.
61.358 (45.21)

The "Institute for the Erection of Low-priced Houses" at Milan, being obliged to demolish two crowded slum sections of that city, has organized the reconstruction so that it may be accomplished progressively, block by block, utilizing for temporary structures open spaces, such as gardens and rear yards. By this means the inhabitants will be able to occupy temporary lodgings near their old homes up to the time of moving into the new lodgings.

Standardized Forms of Metallic Construction, Germany.
62.495 (43)

The Hanover Committee appointed to study forms of metallic construction, has completed the problem of standardization of iron or steel window-frames, and has published proposals for metallic framework for walls. It is preparing, furthermore, for a still greater degree of standardization, including roofs and roofing tiles, ventilators, lighting arrangements and foundations.

Garden Cities and Housing Groups in the Department of the Seine, France.
71.13 + 71.43 (44.361)

A number of organizations, official and semi-official, were occupied even before the war, and especially since, with the problem of meeting the pressing needs for more and better housing for the enormous population of Paris and its suburbs. Among these organizations are The Office of the Department of the Seine for Inexpensive Homes, the City of Paris, the so-called "Assistance de Paris," and both the Rothschild and Lebaudy Foundations. Garden cities and other groups to the number of seventeen, each of from 150 to 1,300 houses, or lodgings, have already been built, great care being taken in each case to provide for health, comfort and beauty of construction, and of general arrangement. Among those now completed or nearly completed are those known as Les Lilas, Drancy, Dugny, Stains, Suresnes, Bessis-Robinson and Malabry. The net cost of these lodgings, including all improvements, varies from 25,000 to 36,000 francs.



Compact arrangement of cutting units makes control easy.

Two views showing how units are pushed—not pulled, the lifting arrangement and absence of weight on cutting units.

“Bulldog” Cutting Units—Why Say More?

We might talk about their Timken Bearings, Alemite lubrication, double-locked adjustments, drop-forgings and special steels—but why? During the past three years the mere name “Bulldog” has come to mean all these things and more. That name means service that three years ago was considered impossible, and today is found in the “Bulldog” alone.

Now “Bulldog” cutting units have been combined into a five unit mower with added advantages as outstanding as those of the units themselves. It

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Municipal and Civic Publications

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Government and Politics of Belgium.—By Thomas Harrison Reed, A.B., LL.B., Professor of Political Science, University of Michigan. World Book Company, Yonkers-on-Hudson, N. Y. 1924. XV + 197 pp. \$1.60.

A review of the essential features of Belgium's governmental organization and party system. Among the features which make this study interesting and valuable are: extensive experience with proportional representation in selecting a national legislature; the testing of simple universal suffrage and universal suffrage with additional votes for wealth and capacity, also the successful application of compulsory voting; abnormally developed party politics; and an original type of municipal administration.

Preliminary Report by the Washington Committee of 100 on the Federal City to the American Civic Association.—Illustrated. 97 pp. Apply to the American Civic Association, 905 Union Trust Building, Washington, D. C.

This Committee was formed to forward the physical development of Washington and to present to the nation at large through the American Civic Association the present status and future needs of the city. Full information is given as to its formation and recommendations, and reports of subcommittees are included on architecture, forest and park reserves, school sites and playgrounds, housing, zoning, street, highway and transit problems, extensions of Metropolitan Washington, water-front development, and industrial development and limitation.

The American Community.—By James Albert Woodburn, of Indiana University, and Thomas Francis Moran, of Purdue University. Longmans, Green and Co., New York. 1924. XLVIII + 455 pp. Illustrated. \$1.48.

An elementary text in community civics, emphasizing the essentiality of community spirit and the obligations which it involves. These obligations are presented in great detail, with a constant appeal to fairmindedness and team-play, and with topics, questions and references for students of elementary and secondary schools. The arrangement of the material and its quality imply the increasing maturity of the student, leading him to the full comprehension of his rights and duties as a citizen.

Safety First for School and Home.—By Harriet E. Beard, A.B., Supervisor of Education, Public Schools, Detroit, Mich. The Macmillan Company, New York. 1924. VIII + 223 pp. \$1.28 postpaid.

This book shows the great need for safety education, and presents the principles that underlie accident prevention in streets and homes, explaining how to remedy conditions that cause accidents, and how to teach and train young children systematically in habits of carefulness. It is full of interesting and practical details. Part II is devoted to the teacher's part of the work, from the kindergarten through the eighth grade, and the appendix and bibliography give a number of effective aids.

The Covering of Open Service Reservoirs in Which Filtered or Ground Waters Are Stored.—By George C. Bunker, Engineer in charge of water purification, The Panama Canal; and August G. Nolte, Assistant Engineer. Reprinted from Journal of the New England Water Works Association, 1923. 30 pp. Illustrated. (Apply to George C. Bunker, Panama Canal, Ancon, C. Z.)

Public Utility Housing Societies.—Bulletin No. 2 of the International Garden Cities and Town Planning Federation, January, 1924. 28 pp. The constitution, operations, methods of financing and management, achievements and prospects of public utility housing societies in Austria, Denmark, Finland, Germany, Great Britain, Holland, Italy, Latvia, Poland, Spain and Switzerland. (Apply to the Federation, 3, Gray's Inn Place, London, W. C. 1, England.)

Housing Problems in America.—National Housing Association, New York. 1924. 408 pp. \$3.00.

Proceedings of the Ninth National Conference on Housing, held in Philadelphia December 5-7, 1923. The papers are grouped in part I under the general divisions of The Cost of Labor; The Cost of Materials; The Cost of Money; Philadelphia's Problems; Rent Control Laws; Zoning; Regional Planning. Part II is devoted to the discussions on the papers, by authorities in the fields represented.

Country Planning.—By Frank A. Waugh, Head of the Division of Horticulture and Professor of Landscape Gardening, Massachusetts Agricultural College. With an Introduction by Kenyon L. Butterfield, President, Massachusetts Agricultural College. Harcourt, Brace and Company, New York. 1924. IV + 183 pp. Illustrated. \$1.25.

Country planning is not regional planning, but this volume emphasizes the natural interdependence of city and country. Country planning seeks to provide for the country the physical equipment which will best serve the social and economic needs of the people who live or visit there. This involves the improvement of transportation, public highways, school grounds, churches and cemeteries, playgrounds and picnic grounds, places of historic interest, housing and farm grounds, villages and towns, telephone, electric light, rural mail delivery, etc. Country planners must study political relations and deal with the problems of maintenance, and in order to get results, must be sure of local initiative, expert advice, time, and money.

New Jersey Commission Government Law (Walsh Act) and Municipal Manager Law.—By Lewis T. Stevens, Member of New Jersey Bar. Published by Albert R. Hand, Cape May, N. J. Fifth edition. 1924. \$2.50.

The Walsh Act is given with all the amendments and supplements enacted up to the end of the 1923 Legislature, in order of topics. Under each topic appear all court decisions on the topic which have been rendered in the state up to January, 1924. The Municipal Manager Law was passed by the 1923 Legislature.

Mortgages on Homes.—Census Monographs II, published by the United States Bureau of the Census. 277 pages. Apply to the Government Printing Office, Washington, D. C. \$1.25.

A report on the results of the inquiry as to the mortgage debt on homes other than farm homes at the Fourteenth Census. The inquiry was conducted by Charles S. Sloane, Geographer of the Census; the text was prepared by Thomas J. Fitzgerald, special agent, who also planned and directed the preparation of the statistical tables; and the manuscript was edited and revised under the supervision of Dr. Richard T. Ely, of the University of Wisconsin. The basic data include the value of the mortgaged homes, the amount of the mortgage debt, and the rate of interest, and are presented in various tabular classifications for geographic divisions and states and for cities having 25,000 inhabitants or more.

The Story of Detroit.—By George B. Catlin. The Detroit News, Detroit, Mich. 1923. XIX + 764 pp. Illustrated. \$2.00 postpaid.

A simple outline history of Detroit's development since the time of Cadillac, written by the librarian of The Detroit News, in which paper it appeared serially in 1923. It has been republished in commemoration of the fiftieth anniversary of the founding of the News, with the idea of making the many thousands of new residents better acquainted with their home city and with the story of those who have struggled and triumphed in its development, and to inspire enthusiasm for the city and for good citizenship.

The Commonwealth Fund.—Fifth Annual Report, for the year 1922-1923. Published January, 1924. 75 pp. Covering the departments of Child Health, Prevention of Juvenile Delinquency, Foreign Operations, and Educational and Legal Research. (Apply to The Commonwealth Fund, 1 East 57th Street, New York, N. Y.)

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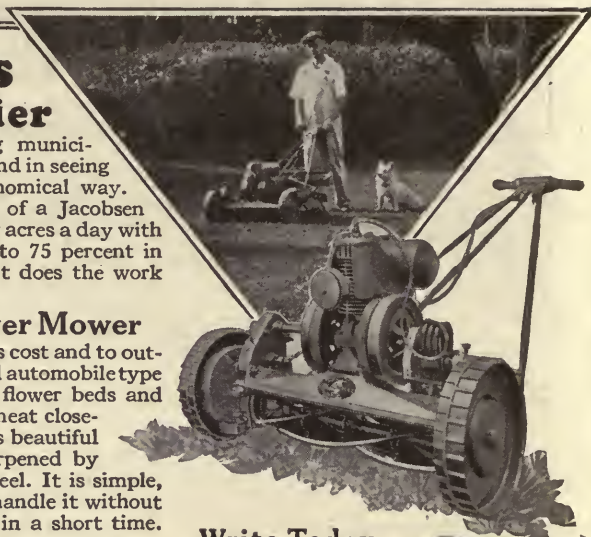
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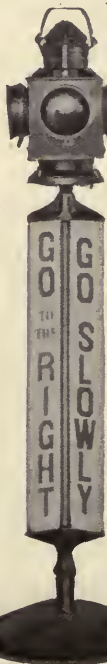
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The Detection and Prevention of Typhoid Epidemics.—By J. Frederick Jackson, Director, Bureau of Sanitary Engineering, Department of Health, Hartford, Conn. Reprinted from *The Nation's Health*, November, 1923. 3 quarto pp. Illustrated. A paper read before the joint meeting of water-works officials and Connecticut public health officials, Hartford, Conn., April 18, 1923. Reviewing important outbreaks of typhoid in Connecticut. (Apply to the Connecticut State Department of Health.)

Buffalo Parks and Public Buildings.—Locations, data, divisions and dimensions of the parks, parkways and minor places in Buffalo, N. Y., December, 1923. 16 pp. Handy size. Issued by the Bureau of Recreation. (Apply to John H. Meahl, Commissioner, Department of Parks and Public Buildings.)

The Modern Hospital Year Book.—Published annually by The Modern Hospital Publishing Company, Inc. Fourth edition. 1923. 604 pp. Illustrated. A reference book of equipment for hospitals and allied institutions, presenting a comprehensive index and classified directory of materials, equipment and supplies and the condensed catalogs and announcements of manufacturers and dealers serving the institution field. (Apply to the publishers, 22-24 East Ontario Street, Chicago, Ill. Limited number of copies available at \$1.00.)

Basic Grading Rules and Working Stresses for Structural Timbers.—Recommendations of the Department of Agriculture. Prepared by J. A. Newlin, in Charge Section of Timber Mechanics, and R. A. Johnson, Engineer in Forest Products, Forest Products Laboratory, Forest Service. Department Circular 295. October, 1923. 28 pp. Giving the results of a half-million tests made by the Forest Products Laboratory to determine the physical and mechanical properties of wood. 5 cents. (Apply to the Superintendent of Documents, Government Printing Office, Washington, D. C.)

Taxation in Toronto.—Report of the Committee on Taxation of the City of Toronto re Single Tax. December 7, 1923. 53 pp. The single tax by-law was voted down on January 1, 1924, by a majority of 30,820. The findings and recommendations of the Committee are to the effect that the tax-exemption by-law, resulting at the end of ten years in taxation on the land only, is entirely opposed to the best interests of the city of Toronto. (Apply to J. C. Forman, Assessment Commissioner, Toronto, Ont.)

Shall New Jersey Tax Motor Fuel?—Published by the Good Roads Association of New Jersey, 164 Market Street, Newark, N. J., as the Trustees' report on the subject adopted by the Association, in opposition to gasoline tax as a super-tax. 28 quarto pp. Tables showing motor vehicle taxes in force in the United States, January 1, 1924. (Apply to the Association.)

America's Fifth City Tries P. R.—In *Proportional Representation Review*, January, 1924. An analysis of the recent election in Cleveland. 32 pp. Illustrated. (Apply to the Proportional Representation League, 1417 Locust Street, Philadelphia, Pa.)

Medical Inspection of Schools.—Bulletin No. 63 of the Russell Sage Foundation Library. February, 1924. 4 pp. 10 cents. A selected bibliography of material on this subject issued since 1914. (Apply to the Russell Sage Foundation Library, 130 East 22nd Street, New York, N. Y.)

Pageantry for Iowa Communities.—By George O. Hurley. Published by the State Historical Society of Iowa, Iowa City, Iowa. 1923. Bulletin of Information Series, No. 10, edited by Benjamin F. Shambaugh. 48 pp. A practical discussion of some of the problems involved in the writing, organization, and production of a community pageant. The material is drawn largely from the experience of the writer, who is a practical pageant master, and the bulletin also contains the results of a careful study of the literature on pageantry. 50 cents. (Apply to the publishers.)

Budget of the City of Cleveland.—In *The City Record*, official publication of the city of Cleveland, Ohio, for January 30, 1924. 68 quarto pp. (Apply to F. W. Thomas, Clerk of the Council.)

Chicago Traffic Regulations.—Complete Digest of Traffic Regulations Governing Motor Vehicles—state laws, ordinances of the city of Chicago, park ordinances, police parking rules. Pocket size. 32 pp. "Don't guess at the traffic laws—read them and know them." (Apply to Al. F. Gorman, City Clerk.)

Oklahoma Municipalities.—Proceedings of the Tenth Annual Convention of the Oklahoma Municipal League. University of Oklahoma Bulletin, February 15, 1924. 74 pp. Containing papers on the following subjects: The Assessment of Abutting Property for Construction of Sidewalks; The Oiling of Earth Roads and Streets; How Cities Can Lessen Their Fire Insurance Rates; The Handling of Municipal Water-Works; Standard Accounting for Oklahoma Cities; Public Utility Regulation in Home Rule Cities in Oklahoma; Rules, Regulations, and Orders of the Oklahoma Corporation Commission as They Affect Cities and Towns; Municipal Swimming Pools; Municipal Ownership versus Private Ownership of Electric Light Plants in Oklahoma; Zoning for Oklahoma Cities. (Apply to The University of Oklahoma, Norman, Okla.)

Financial Statistics of Cities of 30,000 Population and Over, 1922.—Preliminary statement of 261 cities as to assessed valuation of property subject to general property taxes, total revenues, governmental-cost payments, and net debt. 15 pp. (Apply to the United States Bureau of the Census, Washington, D. C.)

Bridging the Hudson at New York City.—Bibliography prepared by the Municipal Reference Library, 512 Municipal Building, New York, N. Y. Fully annotated, and divided into three parts: (1) General Material; (2) Lindenthal Project; (3) New York and New Jersey Bridge Project. 20 pp. 25 cents. (Apply to the Library.)

Ottawa Suburban Roads Commission.—Annual Report of the Engineer for the Year 1923. Also Unit Costs of Work Completed. 22 quarto mimeographed pp. Illustrated with photographic prints. (Apply to Alan K. Hay, Engineer of the Commission, Ottawa, Ont.)

The Town Hall Crier.—No. 1, March 11, 1924. 2 quarto pp. Announcement of the principles, functions and activities of the Town Hall, New York City. Apply to Robert Erskine Ely, Director, The Town Hall, 123 West 43rd Street, New York, N. Y.)

Outdoor Swimming Pools.—By Stanley Pinel. Bulletin 61 of the Engineering Extension Department, Iowa State College, Ames, Iowa. January 23, 1924. 31 pp. Illustrated. Covering principles of design, construction and sanitation, and suggesting approved methods. (Apply to the Department.)

Studies in Citizenship for Women.—A program for women's clubs. Revised edition of University of North Carolina Extension Bulletin, Vol. III, No. 5, November 1, 1923. 43 pp. By D. D. Carroll, M.A., Professor of Economics and Dean of the School of Commerce of the University. Issued by the Bureau of Public Discussion in response to a request from the Civics Department of the North Carolina Federation of Women's Clubs. Simple outlines for study and discussion, covering national, state and local government, and popular control. 50 cents. (Apply to Women's Club Section, Bureau of Public Discussion, University Extension Division, Chapel Hill, N. C.)

School Records and Reports.—A Score Card and Standards for the Records and Reports of City School Systems. By George D. Strayer, Professor of Education, and N. L. Englehardt, Professor of Education, Teachers College, Columbia University, New York, N. Y. Published by Bureau of Publications, Teachers College. 1923. 86 pp. Preliminary edition. A method of checking the records and reports of a school system in order to secure greater uniformity among schools in the collection of data on educational programs or policies. The score card and standards presented are designed for use by the superintendent and the staff in the school systems of cities of 100,000 population and less, and for the use of survey groups in the analysis of records in such school systems. \$1.00. (Apply to C. J. Tidwell, Director, Bureau of Publications.)

The Detroit Metropolitan Area.—A report prepared for the Metropolitan Committee of the Detroit Board of Commerce by the Detroit Bureau of Governmental Research, Inc. January, 1924. 25 mimeographed quarto pp. Maps. A discussion of the feasibility of creating a metropolitan district or districts to include Detroit and neighboring cities and villages, for the purpose of undertaking certain projects that cannot be undertaken satisfactorily by the cities and villages individually. (Apply to the Bureau, 316 East Jefferson Avenue, Detroit, Mich.)

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Directory of Public Improvements in the Cities of Kansas, 1923.—Bulletin No. 44, December 14, 1923. Compiled and mimeographed by the Municipal Reference Bureau, University Extension Division, University of Kansas, Lawrence, Kans. 28 pp. Based on data from approximately 542 incorporated cities. (Apply to the Bureau.)

Drainage and Sewerage, Chicago.—"Memorandum Concerning the Drainage and Sewerage Conditions in Chicago and the Diversion of 10,000 C. F. S. from Lake Michigan at Chicago." Issued by the Board of Trustees of the Sanitary District of Chicago. December, 1923. 92 pp. Map, tables. Describing the drainage and sanitary conditions in Chicago and vicinity and demonstrating the need of the diversion mentioned. The Appendix includes the historical facts regarding negotiations and work in connection with this proposed undertaking. (Apply to William J. Healy, President, The Sanitary District of Chicago, Chicago, Ill.)

The State Park Plan for New York.—Published by the Committee on State Park Plan, New York State Association. January, 1924. Second edition. Revised to show progress to date, with the proposal for the new park bond issue. 96 pp. Views, maps. (Apply to Robert Moses, Secretary, Committee on State Park Plan, 305 Broadway, New York, N. Y.)

Waterways—A Part of the Pittsburgh Plan.—Report No. 6 of the Citizens Committee on City Plan of Pittsburgh. October, 1923. 60 quarto pp. Views, maps, charts, drawings, tables. A study of the problem of water transportation, with recommendations for development; including a specific study of wharf improvement and a section on flood protection. 50 cents. (Apply to George Ketchum, Executive Secretary, Citizens Committee on City Plan of Pittsburgh, Pittsburgh, Pa.)

The Chemical Industry in New York and Its Environs.—Present Trends and Probable Future Developments. By Mabel Newcomer, Ph. D., Associate Professor of Economics, Vassar College. 50 quarto pp. Maps, diagrams, tables. The first in a series of economic and

industrial surveys prepared to show for each of the twelve principal economic activities of the Metropolitan Region the existing location and importance of the activity; growth and movement during the last 25 years; and probable future demands of the industry upon location, space and workers. (Apply to Plan of New York and Its Environs, 130 East 22nd Street, New York, N. Y.)

Sewerage and Sewage Disposal in Massachusetts.—Special Report of the Massachusetts Department of Public Health Relative to an Investigation of Sewerage and Sewage Disposal for the Cities of Salem, Beverly and Peabody and the Town of Danvers and for Certain Public Institutions. January, 1924. 31 pp. Large map. House Document No. 1300. Showing the mutual advantage of the construction of joint disposal works and their operation under a joint board. (Apply to K. H. Goodnough, Chief Engineer, Department of Public Health, 141 State House, Boston, Mass.)

Westchester County Water-Supply.—Report on the Water-Supply of Westchester County, New York, to the Board of Supervisors of the County, by Nicholas S. Hill, Jr., consulting engineer. November 14, 1923. 48 pp. Maps. Covering present and probable future needs and the way to meet them. (Apply to the author at 112 East 19th Street, New York, N. Y.)

Pasadena, Calif.—Annual Report of the Controller of Accounts for the year ended June 30, 1923. (Apply to Geo. H. Wood, Controller of Accounts.)

St. Louis, Mo.—Annual Report of the Board of Commissioners of Tower Grove Park for 1923. (Apply to James Gurney, Jr., Park Superintendent.)

San Jose, Calif.—Annual Report of the Health Department for 1923. (Apply to H. C. Brown, M. D., Health Officer.)

Toronto, Ont.—Annual Report of the Assessment Commissioner for 1923. (Apply to James C. Forman, Assessment Commissioner.)

District of West Vancouver, B. C.—Financial Statement for 1923. (Apply to S. Gisby, Chairman Finance and Light Committee.)

On the Calendar of Conventions

APRIL 9.—WASHINGTON, D. C.

American Civic Association. Second annual conference on the Federal City. Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

APRIL 15-17.—ATLANTA, GA.

Southeastern Water and Light Association. Annual convention. W. F. Stieglitz, Columbia, S. C.

APRIL 25-26.—JEFFERSON CITY, MO.

Missouri Commercial Secretaries Association. Annual meeting. M. V. Carroll, Chamber of Commerce, Springfield, Mo.

MAY 5-8.—CLEVELAND, OHIO.

Chamber of Commerce of the United States of America. Annual meeting. D. A. Skinner, Mills Building, Washington, D. C.

MAY 7-8.—PARIS, TEX.

League of Texas Municipalities. Annual convention. Executive Secretary, Frank M. Stewart, Government Research Division, Bureau of Extension, University of Texas, Austin, Tex.

MAY 13-15.—ATLANTIC CITY, N. J.

National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 40 Central Street, Boston, Mass.

MAY 19-23.—ATLANTIC CITY, N. J.

National Electric Light Association. Annual meeting. Executive Manager, M. H. Aylesworth, 29 West 39th Street, New York, N. Y.

MAY 19-24.—NEW YORK, N. Y.

American Water Works Association. Annual convention. Address: W. M. Niesley, 153 West 71st Street, New York, New York.

MAY 22-24.—MIDDLETOWN, OHIO

Ohio Commercial Secretaries Association. Annual meeting. Secretary, Avery G. Clinger, Chamber of Commerce, Columbus, Ohio.

MAY 26-29.—WASHINGTON, D. C.

Annual Conference on Weights and Measures. Secretary, H. E. Holbrook, Bureau of Standards, Department of Commerce, Washington, D. C.

JUNE 3-5.—ROCHESTER, N. Y.

Conference of Mayors and Other City Officials of the State of New York. Annual convention. Secretary, William P. Capes, 25 Washington Avenue, Albany, N. Y.

JUNE 5-7.—MINERAL WELLS, TEX.

Texas Commercial Executives' Association. Annual Convention-School. Secretary, O. C. B. Nair, Corsicana.

JUNE 11-13.—SPARTANBURG, S. C.

Southern Commercial Secretaries' Association. Annual Convention-School. Secretary-Treasurer, L. P. Dickie, Tampa, Fla.

JUNE 16-20.—DETROIT, MICH.

National Organization for Public Health Nursing. Biennial convention. General Director, Anne A. Stevens, 370 Seventh Avenue, New York, N. Y.

JUNE 19-20.—DETROIT, MINN.

League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, Municipal Preference Bureau, University of Minnesota, Minneapolis.

JUNE 24-26.—BOSTON, MASS.

New England Association of Fire Chiefs. Annual convention. Secretary, Chief John W. O'Hearn, Watertown, Mass.

JULY 2-9.—AMSTERDAM, HOLLAND

International Town Planning Conference. Address: Organizing Secretary, International Garden Cities and Town Planning Federation, 3, Gray's Inn Fields, London, W. C. 1, England.

JULY 20-26.—PALO ALTO, CALIF.

Western Summer School of Community Leadership. Address: Professor Edwin A. Cottrell, Stanford University, Calif.

JULY 20-AUGUST 2.—EVANSTON, ILL.

National School for Commercial and Trade Executives. Address: Robert B. Beach, Business Manager, Chicago Association of Commerce, Chicago, Ill.

SEPTEMBER 23-26.—ROCHESTER, N. Y.

New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

OCTOBER 20-22.—WASHINGTON, D. C.

National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, Raymond B. Gibbs, Kansas City, Kans.

1924.—BUFFALO, N. Y.

International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y. Date to be determined at Directors' meeting in Buffalo, April 15.

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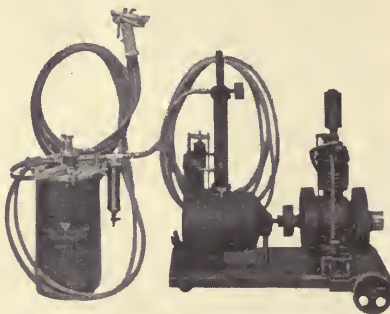
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BOSTON

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Street and Highway Protection Automatically and Economically Performed

By H. E. Gifford

Signal Equipment Engineer, The Adams & Westlake Company, Chicago

WHEN the city of Chicago found its protected boulevards inadequate to take care of the rapidly increasing motor traffic, the municipality provided for a system of "through" or protected streets. Users of these through streets are supposed to enjoy the same protection from cross-traffic that is given on regularly recognized boulevards. At first the only designation of these streets was a sign placed on the right of each cross or intersecting street bearing the wording, "Through Street—Stop." During the daytime these signs functioned fairly well, but after dark they were generally worthless, as no lighting of any kind was provided. A check-up of violations throughout the city showed that after dark very few motorists were aware of the approach to these streets, there being nothing to designate them.

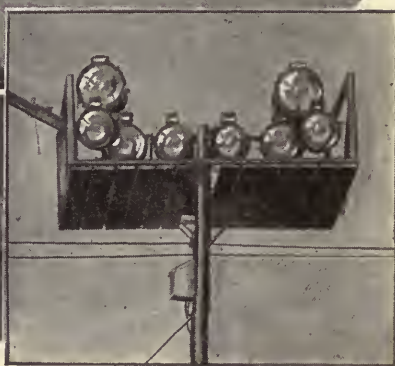
In enforcing the through street ordinances, to prevent serious accidents, it was essential that some efficient method of through street designation be found. It was the desire of those who had the matter in mind to find a signal which combined economy of installation with economy of maintenance, and in addition genuine dependability. The cost of installation was important, inasmuch as a complete installation of signals at every corner where a general street crossed or intersected a through street, would require many hundreds, even thousands, of units. The maintenance item was equally important for the same reason.

It was decided at the outset that the most efficient light signal is of the flashing type. It has the advantage of attracting attention where a stationary light might be unnoticed, especially in a street where there were many other lights. The flasher type of light has long been in use by the U. S. Lighthouse Department and for marking river and harbor channels, also in isolated locations where signals must function for long periods without attention.

The unit selected is nothing more or less than a light standard to be placed on the right of the intersecting or cross-street, 20 to 30 feet back from the through street, plainly visible to the approaching motorist. This standard, the base of which contains a compartment for holding four Edison Primary batteries and flasher relay, is set in the ground so that the top of the compartment is about 6 inches above the



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elevens played to a scoreless tie under
G-E floodlights at Lynn, Mass. A crowd
of 5000 witnessed the game.*

Recreation by Night as Well as by Day



As in other fields of illumination, the General Electric Company has devoted considerable research to the problems of the application of floodlighting. G-E floodlighting projectors are adapted to a vast field of usefulness.

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Football at night has become a practical accomplishment, opening up a vast range of possibilities for recreation well worth the attention of any community.

Hockey by artificial light is common and some cities illuminate their skating parks by means of floodlights. Bathing beaches have also been floodlighted and lighted playgrounds are not unusual.

The broadening of the field for illumination results in increasing the opportunities for night-time enjoyment, thus offering recreation to many city-dwellers who have no other time to secure such pleasures.

Detailed information on the use of floodlighting for purposes of decoration, protection or recreation will gladly be furnished by any G-E office.

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GENERAL ELECTRIC

surface of the ground. Connections are made between batteries, relay and bulb, and the device is ready for service.

There are no wires to bring in from the outside, no digging up of streets to lay conduits, no transformer expense or similar outlay. Every working part of the device is contained within the unit. The signal is in no way dependent on an outside source of power. Every power-plant in town might be closed down and this signal would go right on working as though nothing unusual had happened. A safety signal of this kind is never so necessary as when street lights have failed. All that has to be done to move the signal is to decide upon the new location, sink the standard into position, and fill up the old excavation. There is no wiring to bother with, no necessity of laying new conduits, nor is any engineering skill required.

Through the use of a specially designed reflector and lens the rays from the one-candle-power bulb are amplified several hundred times, so that the signal is readily picked up several blocks away. A simple, effective flasher using less than 1 per cent of the energy required to light the lamp filament, gives a brilliant, snappy flash-light effect that commands attention. A real factor in making this device popular is its very small cost for operation. The current for operating the flasher and lighting is supplied by a number of economical Edison Primary batteries. Under ordinary circumstances these cells will operate the unit for a year and a half to two years without attention of any kind.

One of the outstanding advantages of a signal system using these units is its elasticity. Regardless of whether the requirements in a com-

munity call for ten or a thousand units, they may be installed as needed, and as each is put into service it starts right to work without waiting for the completion of the system as a whole.

Badger Water-Meters for Porto Rico

The Badger Meter Manufacturing Company, Milwaukee, Wis., was recently awarded the contract for furnishing the city of San Juan, Porto Rico, with water-meters. The first part of this order calls for 5,000 meters.

Loading Snow with a Standard Truck Loader

Following the storm of February 20 and 21, 1924, New York City officials contracted with C. J. Mallett, Inc., Bronx, New York City, for the removal of some of the snow which had been piled along the curb. Some of the piles were 10 feet wide and 15 feet high. To load this snow into motor trucks, he used a gasoline-driven standard Model 24 Haiss creeper loader. When the trucks were loaded, they ran to the docks and dumped the load.

By the use of this loader it was possible to handle $6\frac{1}{2}$ to 7 yards of snow in three to four minutes with one operator, and two shovelers cleaning up outside of the feeding propellers. Mr. Mallett stated that the loader saved at least 25 men and got his trucks away faster. The machine used was the standard outfit for handling stone, sand and gravel, but it worked admirably for snow handling with profitable results.



LOADING SNOW WITH MECHANICAL LOADER INTO A 5-TON WHITE TRUCK EQUIPPED WITH A SHADBOLT BODY, AFTER NEW YORK'S ONE BIG SNOW-STORM OF THE WINTER



SAFETY *with* STOP! *for City Streets* *and* GO



The feeble, erring human hand and mind are no longer trusted to guide the crack flyer on its speeding journey—automatic, infallible machine signals have replaced the old switchman. These perfect controls now flash their message to the engineer.

Just so with street traffic. Most progressive cities are relieving the traffic officer from his monotonous post and allowing him to supervise the traffic from a point of vantage on the curb line.



ESSCO MFG. CO.

110 W. WASHINGTON ST., PEORIA, ILL.



HAND AND TRUCK METHODS OF DISTRIBUTING CALCIUM CHLORIDE FOR CURING CONCRETE ROADS AND DUST-LAYING RESPECTIVELY

Spreading Calcium Chloride on Roads

The application of calcium chloride to roads as a dust palliative is increasing yearly. This material is also used for curing concrete roads with great effectiveness. The Dow Chemical Company, Midland, Mich., has developed a spreading device, made primarily for distributing Dowflake, the product of the Dow Chemical Company, which can be used effectively for both kinds of work.

The spreader for application to roads to keep down dust is particularly simple and can be easily attached to any truck. It consists of a V-shaped hopper with an adjustable slot at the bottom, which is attached to the rear of the truck and into which one man can pour the calcium chloride flakes with sufficient rapidity to keep the flow constant. The other spreader is a similar, although smaller, device which can be carried on an ordinary wide-wheeled baggage truck and is used to apply the calcium chloride to concrete roads as soon as it is possible to run on concrete after it has obtained its initial set. The one-man hopper holds from 100 to 200 pounds of Dowflake, and one man with the machine can spread in an hour a sufficient amount of calcium chloride to cover the concrete that the mixer can lay in a day.

A New Meter Service Switch with Safety Locking Device

A new meter service switch with a safety locking feature has been designed by the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., for use in connection with meters placed by central stations in the plants or houses of their customers. The switch is so constructed that theft of current or tampering with the meter switch is impossible. The main cover is hinged at the lower end of the switch cabinet and is equipped with a sealing slot in the upper right-hand side for wire or strap seals to protect the meter. The face of the cover contains a horizontal sliding

steel shutter, through which the service switches are accessible to the user. This steel shutter is controlled by an interlocking device on the externally operated service-control handle which makes it possible to open the fuse compartment only when the control handle is in the "off" position, and prevents closing the switch when the fuse enclosure is open. The device is so connected that the main switch is ahead of the main fuses, assuring the user positive protection while replacing fuses.

Two brackets on the outside of the switch cover provide for locking the service-control handle in either the "on" or the "off" position. An outside ground lug in the upper corner provides for the grounding of the switch-box. Through the use of U-shaped slides in the lower right-hand side of the compartment, these switches may be banked for apartment-house



A TRULY SAFE SWITCH

THE AMERICAN CITY

Illustration is from an oil painting of King Standard as installed at Kansas City, Kansas.

Richly designed, built substantially—King Ornamental Lighting Standards equipped with General Electric Novalux lighting units—provide a beautiful, economical, efficient system of illumination.



KING MANUFACTURING CO
ORNAMENTAL LIGHTING STANDARDS

230 South Clark St. Chicago USA



DUMP BODY WITH TAIL-GATE SWINGING OPEN AS LOAD IS DUMPED

installations. Three of the six styles of this meter are arranged with corrugated test clips and test blades, permitting the test of meters without the interruption of the user's service.

A Quick-Acting Self-Dumping Body for Light Trucks

Having built steel dump bodies for heavy trucks for quite a number of years, the Research and Engineering Department of the Stewart Iron Works Company, Cincinnati, Ohio, has developed a new automatic or gravity-dump body for Ford one-ton trucks. The body is constructed of steel, has one-cubic-yard capacity, and is dumped by a control lever from the driver's seat. This same lever returns the body to place. The driver does not have to leave the seat to dump the body or to return it to place. The tail-gate opens automatically when the body is dumped, and closes automatically as the body is returned. The body is also furnished with mud-guards to protect the cab and body from splashing. The loading edge of the body when mounted on a Ford chassis is 47 inches from the ground with the body loaded, making it probably the lowest body on the market to-day.

The tail-gate is double-acting, permitting the body to be used for any purpose, making it suitable for road building, general municipal ser-

vice, contracting and other work. The dumping angle for the steel body, made of one piece of No. 10 gage sheet steel, is 45 degrees.

A Convenient Rubbish Basket

Many of the complaints regarding paper dropped on the street or in parks or about school yards could be done away with if cities would provide plenty of trash cans to receive old newspapers, paper bags and similar material. The average citizen does not want to carry an old newspaper around with him, and is very liable to drop it in the gutter unless he sees a trash can ready to receive it.

The Cyclone Fence Company, Waukegan, Ill., is making a catch-all basket which is par-



A WIRE RUBBISH BASKET IN USE AT AN AUTO TOURIST PARK



DUMP BODY IN FULL DUMPING POSITION WITH TAIL-GATE EXTENDED

ticularly adapted to parks and schools. The basket is well built of heavy crimped wire, electrically welded, with a bottom of heavy sheet steel, ribbed and perforated. A cover is furnished, chained to the basket, so that all that is necessary is to set the basket out in an open space, touch a match to it and the rubbish is completely consumed. A carrier is made to fit the catch-all basket, which is convenient when the basket must be carried a considerable distance for emptying or burning the contents. The carrier is built with two handles, and the basket itself is 29 inches high.

There is no motor truck built that will give more years of service at less cost than the Federal. That is why so many municipalities are using Federals in great numbers with complete satisfaction.



Spring cleaning time in cities and towns requires up-to-date motor truck equipment. Federal Flushers like the one here owned by Provo City, Utah, are helping to clean up hundreds of cities all over the country. Write for complete specifications of this combination flusher and sprinkler on Federal chassis.

Write for Booklet S.10 "Making One Thing Better."

FEDERAL MOTOR TRUCK COMPANY
Detroit, Michigan

Illuminating the New York-New Jersey Vehicular Tunnel

The general features of the construction of the New York-New Jersey vehicular tunnel are quite well known to the general public. The tunnel will consist of two tubes, one for east-bound and one for westbound traffic. Each will be 29 feet 6 inches in diameter and 9,250 feet long. The roadways will be 20 feet wide and have overhead clearance of 13 feet 6 inches. The rest of the space within the tubes will be required for the ventilation system, which consists of air ducts at the top and bottom of each tube. Fresh air under compression will be forced into the lower duct and from there into the roadway itself through air flues and expansion chambers placed at intervals of 15 feet along each side of the tunnel. This will force the vitiated air out through openings, also at 15 feet intervals, into the top ducts, whence it will be drawn out by large fans and discharged through the caissons at the ends of the tunnels.

The tunnels are now being constructed from both ends and will meet somewhere under the river. The tunnels are built in ring sections of 14 cast-iron plates each, each plate weighing a ton and a half. The excavating is done in shields or cylinder heads, which are pushed for-

ward 2½ feet at a time by 30 hydraulic jacks. As the shields move forward, the rings are added one by one. When completed, the tunnels will have a protective covering of broken stone and at each entrance there will be a modern pier above the tunnel as it reaches the land, to avoid the possibility of a ship's running into the tunnel where it comes up.

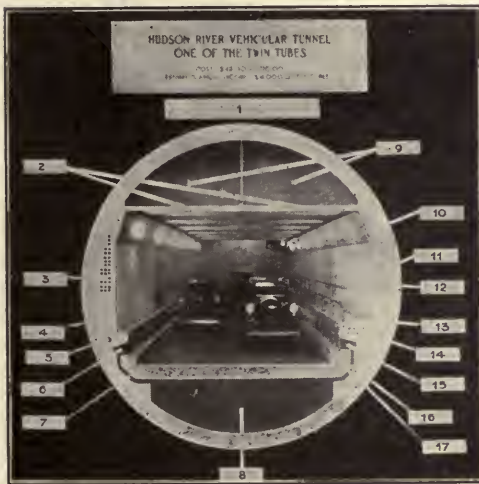
One of the most difficult problems with regard to the prospective use of the tunnel for vehicular traffic has been the question of proper illumination. The engineers of the New York-New Jersey Bridge and Tunnel Commission, Clifford M. Holland, Chief Engineer, have given this problem careful study and developed a system which has been worked out by the Illuminating Engineering Laboratory of the Westinghouse Lamp Company. In order to study all suitable systems of illumination under approximate operating conditions, an exact model of the tunnel on a scale of 1 inch to 1 foot and 10 feet long was constructed at the Westinghouse Lamp Company's plant at Bloomfield, N. J. Exact replicas of the recommended lighting units were installed in this model tunnel, furnishing an amount of light corresponding accurately to the desired illumination. The model tunnel pictured above is complete in every detail, even to the brass railing along the walk for pedestrians.

The proposed lighting unit itself consists essentially of a cast iron box containing a cast iron enameled reflector, a 100-watt lamp provided with suitable mounting, and a hinged cover, furnished with a diffusing glass. The face of the cast iron outer box is provided with a simple ring bolted on, which in turn carries the hinges supporting the cast bronze door. The units are set flush with the wall, placed opposite on 20-foot centers, and are tilted downward at the angle of the tunnel wall, approximately 20 degrees. Servicing is from both sides of the river to alternate units. The engineers of the Tunnel Commission have very elaborate plans providing for the isolation of each small group of units so that maintenance may be as easy as possible.

The combination of flush-type units and diffusing cover, together with the close spacing, gives a remarkably uniform illumination of an average intensity of two-foot candles. The fact that the ceiling is lighted and free from sharp shadows obviates a so-called "tunnel" appearance and many resulting bad psychological effects. This is important, not only for comfort in driving, but also for giving the tube a pleasing appearance.

Pearse, Greeley & Hansen Move Office

Pearse, Greeley & Hansen, hydraulic and sanitary engineers, Chicago, Ill., have announced that they will remove their offices on April 15, 1924, from 39 West Adams Street, to the Tower Building, 6 North Michigan Avenue, at the corner of Madison Street, the Loop District. This organization will continue to be available for engagements for consulting work in connection with sanitary works.



A MODEL OF THE HUDSON RIVER VEHICULAR TUNNEL, SHOWING THE TENTATIVE LIGHTING SYSTEM

The numbers on the face of the model indicate the following points: 1. The ventilation of the tunnel is carried on transversely with no longitudinal movement of the air. Air is completely changed 42 times an hour. 2. Exhaust port for ventilation every 15 feet throughout the length of the tunnel. 3. Telephone and telegraph cable ducts which will produce an annual income of \$100,000. 4. Fire extinguisher. 5. Water-supply pipe. 6. Continuous fresh air supplied to roadway. 7. Fresh-air flues every 15 feet. 8. Fresh-air duct running the entire length of the tunnel. 9. Exhaust-air duct running the entire length of the tunnel. 10. Tunnel segment weighing 3,000 pounds. 11. Weight of complete segment ring, 21.6 tons. 12. Concrete liner for tunnel. 13. Sidewalk. 14. Power cables for operation of tunnel. 15. Fresh-air expansion chamber. 16. Fresh-air flues every 15 feet. 17. Drain.

Prices listed in the oval frame:

- \$174.10 Tires
- \$114.75 Oil
- \$199.75 Oil
- \$97.11 Oil
- \$103.75 Gasoline
- \$79.11 Oil
- \$256.10 Repairs
- \$86.25 Oil
- \$201.24 Gasoline
- \$49.75 Tires
- \$194.11 Gasoline
- \$75.40 Oil
- \$87.56 Gasoline
- \$41.10 Oil
- \$279.55 Repairs
- \$112.10 Repairs
- \$47.10 Oil
- \$77.14 Tires
- \$86.75 Repairs
- \$201.72 Repairs
- \$174.50 Repairs
- \$117.21 Gasoline
- \$107.74 Gasoline
- \$147.11 Gasoline
- \$127.50 Oil
- \$71.11 Repairs
- \$214.64 Gasoline
- \$91.01 Oil
- \$142.14 Repairs
- \$224.16 Gasoline
- \$74.12 Oil
- \$47.34 Repairs
- \$71.11 Oil
- \$217.11 Tires
- \$41.11 Oil
- \$94.75 Tires

Are You Being Handcuffed By Figures Like These ?

Gasoline—Tires—Oil—Repairs—How Quickly Expenses Like These Mount Up and Cut into the Police Appropriation and Yet They Can Be So Easily Reduced to a Minimum. Read the Following Reports and You Will See How Police Chiefs Everywhere Are Reducing Departmental Expenses With the New Indian Scout.

CHIEF WILLIAM J. QUILTY, of Springfield, Mass., reports that three automobiles ran a total of 48,715 miles on 3,958 gallons of gasoline and 146 gallons of oil. At the same time he operated seven Indian Scouts which covered a distance of 50,193 miles on 1,383 gallons of gasoline and 79 gallons of oil.

For the sake of comparison, compare the operating expense of 7 automobiles with that of 7 Indians and you will readily see how much money you can save—

7 Automobiles

9233 Gal. Gasoline at \$.20.....	\$1,846.60
146 Gal. Oil at 1.00.....	146.00
	\$ 1,992.60

7 INDIAN MOTORCYCLES

1383 Gal. Gasoline at \$.20.....	\$ 276.60
79 Gal. Oil at 1.00.....	79.00
	\$ 355.60

No matter what the size of the town, the police motorcycle is an excellent investment. Macon, Ga., police department using 10 motorcycles policemen averages \$15,666 yearly in fines collected for speeding and traffic violations. New York City motorcycle police made a clear net profit of \$481,662 in 9 months—using Indian Motorcycles.

Consider the great expense of an automobile; consider the advantage of the average auto in catching speeders, thieves and criminals in high-powered motor cars and you will see the advantage of using Indian Motorcycles in your department.

INDIAN SCOUT

—the Ideal Police Motorcycle!

100 pounds lighter than ordinary motorcycles, yet powerful enough to overtake high powered motor cars. Left-hand throttle control leaves right hand free for action. Low saddle position and perfect balance makes Indian Scout easily manoeuvred through densest traffic—the ideal motorcycle for patrol duty, escort work and catching speeders.

Thousands are now in use by police throughout the country.

The Indian Motorcycle Company are more than just manufacturers of motorcycles. They are specialists in police requirements and will gladly analyze your needs and make recommendations. No obligation. Write for new booklet "Maintaining Law and Order." Address Dept. A4.

Indian Motorcycle Company

Dept. A-4 Springfield, Massachusetts

Diven, Jr., with Kelly Concrete Well Company

Jack M. Diven, Jr., well known to the water-works fraternity, is now representing the Kelly Concrete Well Company of Grand Island, Nebr., in the New York District. His address is 235 West 71st Street, New York City.

Good Roads Machinery Company Establishes Chicago Warehouse

In order to give better service to customers, the Good Roads Machinery Company, Inc., Kennett Square, Pa., has established a warehouse in Chicago at 49th and Halsted Streets, where it will carry a complete stock of road-building machinery and parts, making possible quick shipments of repair parts for emergency cases. The local offices of the company will be established at the warehouse.

New Fire-Alarm System for Gastonia, N. C.

A contract for a six-circuit fire-alarm system was awarded to the Gamewell Company, Newton Upper Falls, Mass., on February 26, by the City Council of Gastonia, N. C. Sixty porcelain steel Peerless boxes, each with a quick-action door, are to be installed on the streets. A storage battery switchboard and a repeater together with generator and necessary battery are to be installed at fire headquarters. Provisions have been made to care for the growth of the city, as 150 boxes may be installed without increasing the central station equipment.

Recent Orders for Fire Apparatus

Among the recent orders for Childs-equipped fire apparatus, the Motor Fire Equipment Department of the Foamite-Childs Corporation, Utica, N. Y., reports the following: triple combinations for Fox River Grove, Ill., Sharon, Pa., Hanover, N. H., Bridgton, Me., Laurinburg, N. C., Van Alstyne, Tex., Manor, Pa., Hastings, Pa., Pascoag, R. I., Margaretville, N. Y., Andes, N. Y., Mt. Carroll, Ill., and Amenia, N. Y.; single-tank combinations for Athens, Tex., Manhasset, L. I., and Granville, N. Y. Orders for two-tank chemical equipment have been received from Mount Lake Park, Md., for a pump and hose car for Barrington, N. J., and for a straight hose car for Bedford Hills, N. Y.

Portland Cement Association Staff Changes

C. D. Franks, who since June, 1916, has been District Engineer in charge of the Association's Indianapolis office, is appointed Assistant General Manager in administrative charge of Association work in the districts covered by the Minneapolis, Milwaukee, Des Moines, Chicago,

St. Louis, and Indianapolis offices. Until June 1, 1924, Mr. Franks' headquarters will be the Merchants Bank Building, Indianapolis. After that date his headquarters will be 111 West Washington Street, Chicago.

L. C. Miller succeeds Mr. Franks as District Engineer in charge of the Indianapolis office. Since February, 1917, Mr. Miller has been Association Field Engineer in Indiana, and during his work in that capacity he has acquired a large acquaintanceship in the district of which he now takes charge. The Indianapolis office of the Association, located in the Merchants Bank Building, is in charge of the Association work in Indiana and Kentucky.

A new Association office is open in Charlotte, N. C. John E. Tate, heretofore District Engineer in charge of the New Orleans office and previously Association Field Engineer in North Carolina, is appointed District Engineer in charge. Until July 1 this office will be located in the Piedmont Building. After that date the permanent address will be the Johnston Building. The Charlotte office will be in charge of Association work in North Carolina.

State Law Makes Better Fire Protection Possible

In 1923 California passed a law empowering any unincorporated settlement or district to determine by popular vote whether or not it should be formed into a fire district. At the same time the voters are required to authorize the necessary tax levy to purchase, house and maintain the fire apparatus. The tax rate for this purpose has, of course, varied widely, in some cases running as low as 10 cents per \$100, while in others the assessment has reached 50 cents per \$100. This is, of course, directly controlled by the taxpayers themselves, and is an accurate measure of their keen interest in their fire protection problem. The fire district when organized falls under the supervision of the county fire warden, who is also county forester. This official is directly responsible to his county board of supervisors.

Los Angeles County is the first to effect an extensive fire department organization, although many localities have taken advantage of the law to improve their fire protection facilities by the addition of motor equipment. Los Angeles County fire district has contracted for the purchase of ten American-LaFrance type-75 triple-combination pumping chemical and hose cars, made by the American-LaFrance Fire Engine Company, Inc., Elmira, N. Y. This design is particularly adapted for this type of fire fighting. The construction of the chassis with its chrome nickel steel frame and cross-members means rugged strength without excessive weight, while the simple and compact rotary gear pump gives high pumping capacity without undue bulk, so that the full power of the motor is utilized to carry the essential load rather than a massive chassis.

KEEP ROADS UP AND TAXES DOWN WITH
DOWFLAKE
CALCIUM CHLORIDE

"Road Maintenance by Dust Prevention" Costs Less

The rapid rise of highway engineering to a leading position among the larger industries has naturally attracted many of the foremost engineers to this work. These men have developed new methods worth using in country, village and city. Road maintenance by dust prevention with *Dowflake* is one of the most noteworthy developments in highway work.

From the time when a few tons of *Dowflake* was demonstrated to a county highway department until state departments began buying train loads, only a few years passed. Townships recommended *Dowflake* to adjoining townships. County officials vied with each other to build better roads—to make them last longer, and to make them more satisfactory to both residents and motorists. *Dowflake* fitted right into their plans for it kept roads better, made them last longer—it reduced maintenance costs to a surprising degree and made records for road officials.

When the road bed is in condition, an ordinary truck load of *Dowflake* driven over it at normal speed distributes *Dowflake* as it goes by means of a spreading attachment fastened to the rear of the truck. One man drives, another keeps the hopper full of *Dowflake*—when the truck has passed the job is done for months. Three men and two trucks will cover 20 miles in a day.

Free Book: "How To Maintain Roads"

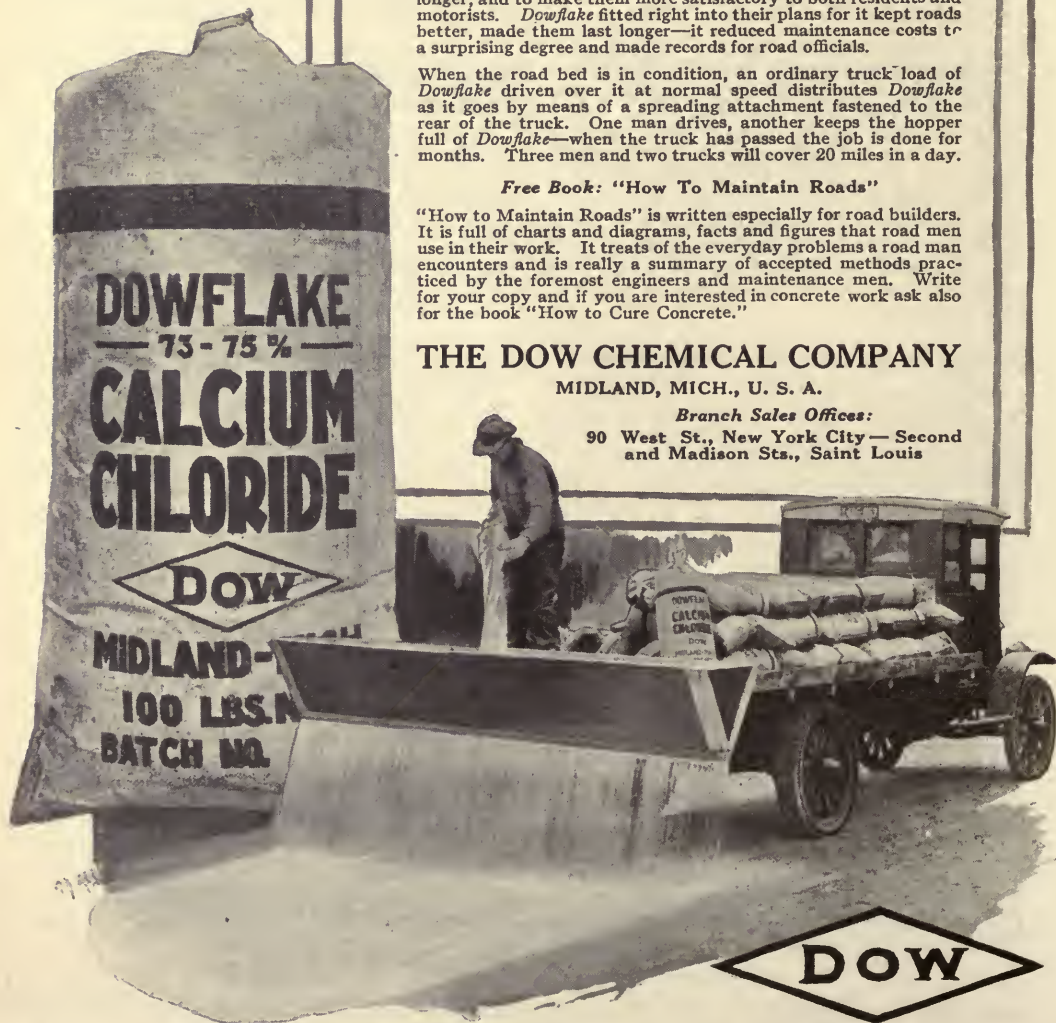
"How to Maintain Roads" is written especially for road builders. It is full of charts and diagrams, facts and figures that road men use in their work. It treats of the everyday problems a road man encounters and is really a summary of accepted methods practiced by the foremost engineers and maintenance men. Write for your copy and if you are interested in concrete work ask also for the book "How to Cure Concrete."

THE DOW CHEMICAL COMPANY

MIDLAND, MICH., U. S. A.

Branch Sales Offices:

90 West St., New York City—Second
and Madison Sts., Saint Louis



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No. 5

MAY
1924

The American City Magazine

443 Fourth Ave.
NEW YORK

50 Cents
\$4 a Year

Five-, Ten-, and Twenty-Five-Year Improvement Programs

IT cannot be supposed that the "happy thought" method of planning municipal programs will ever become wholly extinct. Impulse and emotion play too important a part in human life to disappear entirely, either in the shadow of caution or in the bright light of intelligent progress. But, fortunately for the welfare of our cities, impulse and emotion in municipal development are calling to their aid, more and more, the modern science of city planning. Happy thoughts are finding guidance in forethoughts.

This long-time planning is now, on its part, being made more practical and effective by step-by-step programs of accomplishment. Such program-making involves a careful analysis, on the part of municipal officials and civic bodies, of the comparative importance and urgency of the various projects proposed, and of the possibility of financing them. As specific examples of this growing movement, Bluefield's five-year program and the ten-year programs of Dayton and Kansas City have already been mentioned in these columns. Recent evidences of the spread of the idea of planning ahead for a definite term of years come from such widely separated cities as Dallas, Albany, N. Y., San Francisco, and Duluth.

In line with its city's slogan, "Dallas, Where Men Are Looking Forward," the Dallas Chamber of Commerce has named a committee to map out a program for the next twenty-five years. All phases of the city's development—industrial, commercial, civic and social—will be considered. Incidentally, the thorough manner in which the Dallas twenty-five-year Program Committee is going about its task is indicated by the fact that Chairman Frank McNeny has placed an order for twenty-five

yearly subscriptions for THE AMERICAN CITY, one copy to be mailed each month to each of the committee members.

In Albany, N. Y., the Chamber of Commerce also is taking the lead, and a ten-year program of city planning and municipal improvements is being worked out. San Francisco, likewise, has adopted the decade as the unit, and City Engineer M. M. O'Shaughnessy is actively advocating his "Ten-Year Program of Civic Development" before the commercial and civic organizations of the city.

In Duluth the Taxpayers' League has issued "An Inventory of Proposed City Projects," on the front page of which three questions are asked: "What Do We Want? What Do We Need? What Can We Afford?" In the pamphlet are described thirty different projects which are being actively advocated by community clubs, civic organizations, trade associations and individuals, at a total estimated cost of over \$38,000,000—approximately 30 per cent of the assessed valuation of the entire city. The Taxpayers' League points out that obviously such a program cannot be carried through to completion within the immediate future, and urges the citizens of Duluth "to consider the importance of each permanent improvement in relation to all projects; to realize the necessity of drawing up a ten- or fifteen-year permanent improvement program in the order of general community benefit; to bear in mind the financial ability of the community to pay the cost."

As a means of combating the unthinking hue and cry against municipal extravagance, and of providing for the construction of needed public works in some relationship to their real urgency, the five-, ten- or twenty-five-year program has great value.

The Removal of Iron from the Public Water-Supply of Shelby, Ohio

By Philip Burgess

Burgess and Niple, Engineers, Columbus, Ohio

THE public water-supply at Shelby, Ohio, was installed by the local water company in 1897 and was obtained without treatment from drilled wells extending about 50 feet into the drift bordering on Black Fork Creek. The supply proved unsatisfactory on account of its high iron content, and in 1905 the water company installed purification devices to remove the iron from the water. These devices included aeration by baffles in the top of the stand-pipe, followed by sedimentation in the stand-pipe and, finally, by filtration through two horizontal steel pressure filters, each 8 inches in diameter and 24 feet long. The filtering material comprised coarse crushed quartz 18 inches deep. These devices proved fairly satisfactory, and the iron was reduced from approximately 7 parts to about 0.6 part per million.

Subsequently, when the water consumption at Shelby increased from 300,000 gallons daily to about 700,000 gallons daily, or over double the supply obtained during the year 1905, the removal of iron by the purification devices was not at all satisfactory, and the writer was retained by the water company to design a new iron-removal plant. Subsequently his firm entered into a contract in 1919 to construct this plant in accordance with the design furnished.

Features of New Removal Plant

The general features adopted in the new purification plant were similar to those in the old plant and comprised aeration, sedimentation or coagulation, and filtration through rapid sand filters of the open, or gravity, type. At about the same time the source of supply was changed from the old drilled wells to two new dug wells, each approximately 45 feet deep. The nominal capacity of the new plant is 1,000,000 gallons daily.

Water is pumped from the new wells by motor-driven centrifugal pumps, which dis-



PUMPING-STATION OF THE SHELBY, OHIO, WATER-WORKS

charge the water through perforated horizontal pipes and distribute it over the tops of the aerators, which are based upon a nominal capacity of 17 gallons per square foot per minute. The aerator is composed of three horizontal trays, each containing coarse coke. The trays are 12 inches deep, with 12-inch open spaces between the trays. The bottoms of the trays are covered by wire screens containing $3\frac{1}{2}$ meshes per inch and composed of iron wire 0.105 inch in diameter. The 12-inch coke layers are composed of particles ranging in size from $\frac{1}{8}$ - to 3-inch diameter. Each tray is 4.5 x 9 feet in section with a total area of 40.5 square feet. The aerator is located over one end of the coagulating or settling basin.

The aerated water falls by gravity into one end of the coagulating basin, which is an uncovered tank of reinforced concrete construction 14 x 43 x 10.5 feet deep, holding 47,300 gallons. The nominal period of retention in the basin is about one hour.

The coagulated water flows by gravity to two open gravity rapid sand filters, each containing 240 square feet of sand area. The filters are designed to operate at a nominal rate of 100,000 gallons per acre daily, or somewhat less than the nominal rate usually adopted for rapid sand filters treating surface water-supplies. The strainer systems of the filters comprise 10-inch cast-iron main collectors and $1\frac{1}{2}$ -inch galvanized-iron late-

rals, spaced 6 inches apart and perforated with six $\frac{1}{4}$ -inch round holes per lineal foot. Over the strainer system is placed 12 inches of filter gravel comprising particles ranging from $\frac{1}{12}$ to 2 inches in diameter. Above the gravel is placed 2 feet of filter sand, which has an effective size of 0.49 millimeters.

The filters are washed from a 10-inch connection to the stand-pipe, and the rate of application of the wash water is from 20 to 24 inches rise per minute. The tops of the wash-water troughs are 24 inches above the filter sand.

The filtered water discharges by gravity into the clear well below. This is of reinforced concrete construction and holds about 250,000 gallons. The filters and operating gallery are covered with a substantial brick superstructure.

The new iron-removal plant at Shelby was placed in operation on March 19, 1920, and it has continued to give satisfactory results since that time. It is of interest to note that the very first water treated in the plant came through clear and sparkling. The iron content of the raw water ranges in well No. 1 from 14 to 16 parts per million and in well No. 2 from 6 to 8 parts per million. The untreated water contains from 40 to 50 parts of free carbonic acid and no dissolved oxygen. The aerated water contains from 20 to 30 parts of free carbonic acid, and generally is about 65 per cent saturated with dissolved oxygen. The filtered water generally contains from 10 to 15 parts of free carbonic acid and from 0 to 0.3 part of dissolved iron.

Experience with the continued operation of the plant indicates that the aerator performs a very essential part of the purification process. It is necessary from time to time to clean the contact material of the aerator, as



THE STAND-PIPE OF THE SHELBY, OHIO, WATER-WORKS

this tends to become clogged with iron sludge. When the aerator is dirty the water is not distributed over the trays and is not properly aerated, with the result that a heavy burden is placed upon the filters, with a material reduction in the elimination of the iron. Poor operation of the aerator is readily noticeable by the green color of the water in the coagulating or settling basin. Under good operating conditions, the treated water is, of course, red.

Desirable Changes Based on Experience

Experience indicates, also, that considerable sludge is removed by the settling basin, although doubtless a large percentage of this



THE FILTRATION PLANT

sludge is washed through from the aerator. The writer believes that proper operation would be more readily obtained if the aerator were made of larger area and designed on a rate of about 10 gallons per square foot per minute instead of 17 gallons per square foot, as used in the original design. In general, the results secured by the plant are very satisfactory when proper aeration is obtained, but are not satisfactory when the aerators are neglected or clogged.

Experience indicates also that somewhat deeper gravel layers should be provided in the filters, as the 12 inches available is not sufficient to prevent the moving of the gravel during continued washings of the filters.

The water consumers at Shelby have been very much pleased with the results accomplished by the plant, and, in fact, the company has been able to secure a material advance in rates on account of the improved service rendered and on account of the satis-

factory character of the water-supply provided by the new plant.

Another feature of interest is the fact that the considerable iron content in the supply previously delivered into the mains and services was sufficient to cause many complaints by the clogging of service lines and by the stoppage of meters. These difficulties have been practically eliminated by removing the iron from the water-supply. This, of course, benefits the water company as well as the consumer and promotes much more desirable relations between the company and its customers. In general, these improved relations have resulted in an increased income and benefits to the company and in an increased enjoyment in the use of the public water-supply by the customers. The benefits derived from the new plant have more than compensated the company for the expense entailed by its construction, which amounted to about \$35,000.

Improvements in the Water-Works Power-Plant, Dubuque, Iowa

By L. J. Jellison

BY a vote of almost four to one in 1923 the city of Dubuque, Iowa, carried a \$325,000 water-works bond issue which is paying for improvements in the water-works system. Among the most important improvements will be a fire-proof structure for the city pumping equipment on which the water-supply for the entire city depends. This will remove the now ever-present danger of the city's being completely shut off from its supply of water by a fire which at any time might destroy or damage the pumping-station of the water-works.

The present four boilers, three of which are practically unfit for longer service, will be augmented by two 400-horse-power electric motors, and there will be installed an 7,500,000-gallon centrifugal pump, two air compressors with a capacity of 2,500 cubic feet of air per minute for the operation of air lift and to increase the output of the artesian wells from 1,000,000 to approximately 5,000,000 gallons daily.

The New Pumping-Station

The new pumping-station and power-plant built for the city water-works at the Eagle Point station is strictly fire-proof and modern in every respect. The building is divided into two parts, a pump room and an auxiliary pump room, separated by a heavy brick fire-wall. The size of the auxiliary pump room is 99 feet 9 inches by 57 feet 4 inches, and 45 feet in height between the floor level and the underside of the roof truss. The roof truss is of steel covered with fire-proof tile. The pump room is 142 feet 6 inches by 59 feet 6 inches and 26 feet between the floor level and the underside of the roof truss, which is also steel and covered with tile, the walls being of brick and concrete.

All window-frames are made fire-proof by the use of steel frames and sash. The floors are made of reinforced concrete. The present 250-horse-power water-tube boiler is attached to the new battery, making a power-plant of 950 horse-power.

Some Good from the Housing Shortage

New Construction Methods and Salvage of Old Dwellings

By **Bernard J. Newman**

Managing Director, Philadelphia Housing Association

THE cities of the world are in a hectic state because of the high cost of dwelling construction, with the resultant inability to build sufficient housing accommodations to provide for their normal population growth. European cities, in spite of their experiments with municipal housing and rent control, still have excessive congestion with a high percentage of one-room occupancy. Comparatively few American cities felt the pressure of housing needs until recent years, but now the housing shortage is universal. The nation needs about 1,000,000 more homes. Dwelling construction now under way is too expensive for the average citizen, while practically no houses are being built for the small-wage earners. This shortage of homes is giving speculators a chance to exploit renters, and in almost every community loud protests are being voiced against high rents. Furthermore, while there is a tendency toward stabilization of commodity prices, though on a higher level than in 1914, in the field of housing rents have not yet reached their peak.

This situation constitutes an emergency, unsettling social relationships and disturbing industrial conditions. Perhaps it is not an unmixed evil, since it is challenging public attention and stimulating plans to simplify construction detail. It is actually forcing the building industry to think in terms of cost-cutting and to adopt labor-saving devices. Thus, greater standardization of parts, such as the sizes of bricks and of concrete blocks, of locks, door and window frames, plumbing piping, traps and fixtures, is becoming popular. Greater use is being made of materials in new forms, such as machine-made plaster board. Mass production of dwellings, with the application of engineering methods and the attraction of engineering talent, is taking the place of the old rule-of-thumb practice that has so long prevailed. These are evidences of a gain being forced by the abnormal housing situation and the high material and labor costs of construction.

But there is another gain in the economy of use of dwellings. The cities of the United States have been prodigal in their use of buildings. Neighborhood changes have been

invited by lack of control over the use to which dwellings have been put, and these changes have caused vacancies, with a wasteful non-use of structurally sound houses, while owners have waited for new uses to come into their neighborhoods. There have been unnecessary delays in the renovation or replacement of outgrown structures, and there has also been some premature scrapping of old houses. More serious has been the neglect to make repairs and to maintain conditions which encourage sanitation, with a pronounced trend toward congested occupancy, without the installation of sanitary improvements to modify the hazards of overcrowding.

It is notorious that the older cities of the country have been most at fault in these matters. Some, however, are now pointing the way whereby a higher percentage of use may be obtained from old buildings. They are demonstrating that the need for new housing may, in part, be met by the re-use of old houses. Philadelphia perhaps is typical in this respect. Those familiar with the layout of the older sections of the city know there are countless rear courts and alleys, some reclaimable and others that have literally deteriorated into dens of disease and iniquity. One typical court of nine houses occupied by fifteen families illustrates this latter group. During a three-year period, the local Housing Association found in the records of eleven welfare agencies dealing with these families, twelve cases of illegitimate children, three cases of brutality to children, two cases of incorrigible boys, one case of rape, two deserting husbands, nine deserting mothers, three habitual women drunkards, two habitual men drunkards, three mentally deficient children, four cases of tuberculosis, eight hospital cases, six cases of serious sickness among infants, and seven cases of poverty.

Renovations in Philadelphia

At various times groups of Philadelphians have experimented in the renovation of these old courts. The Henry Phipps Institute reclaimed one area in an experiment with home treatment of tuberculosis cases under conditions permitting adequate light and ventilation. As a social experiment in property man-

agement, the Octavia Hill Association has renovated several courts and alleys, and rented these properties to the low-rent-paying groups. But the relatively large number of such houses, near the center of the city, have been allowed to fall gradually into disrepair and to be occupied by tenants who have little, if any, conception of the value of house hygiene and sanitation.

Typical of this latter group were sixteen small brick houses on a minor street, 105 feet long and 18 feet wide, in the central part of the city, a block and a half from one of Philadelphia's most exclusive residential sections. These dwellings, which housed 87 people, were slatternly in appearance, with broken windows and loosely hanging shutters. The street was without a sewer, and none of the buildings had sanitary equipment. Their shallow yards were cluttered with unsightly outhouses, and rubbish was piled high. The street itself contained many depressions in which mud and surface drainage lay.

In 1922 a Philadelphia manufacturer conceived the idea of renovating this street. He

was able to take title to both the street and the dwellings. The building laws would not permit new dwelling construction, because the street was too narrow and the lots too shallow. After the eviction of the tenants and the removal of their household goods, over fifty wagon loads of rubbish were cleaned from the cellars and the yards.

The houses were stripped to the walls, partitions and floors, and thoroughly disinfected. They were replastered, new trim was built in, hardwood floors were laid, and tiled bathrooms, complete sanitary equipment, electricity and a central heating plant were installed. Each house was converted into a little four-room apartment with a kitchenette, a common living and dining room and two bedrooms. The outside coating of white and buff stucco, with colored tile insets, gave the walls the appearance of new construction. Window shutters of bright color were hung; and iron balconies and rails similar to those used in Italian cities and craftsman lanterns gave to the whole an attractive and artistic appearance, in extreme contrast to the original drab look of the property. The street



UBER STREET, PHILADELPHIA, PRIOR TO RENOVATION

bed was changed to a walk, and the old sidewalks, converted into green grass plots with dwarf evergreens, enforced the contrast.

A Beneficial Demonstration

The houses are popular and profitable. The original rents of \$12 have been increased to \$100, \$110, and \$120. Janitor and maid service is furnished the tenants. What has developed here is practically a horizontal in place

of a vertical apartment house, all families living on the ground floor with a privacy not obtainable in the modern apartment hotel. The owner has profited, but he has done more by his renovation. He has increased the assessed value of the property and of the land surrounding, and hence has increased the tax return received by the city. This manufacturer has demonstrated the possibilities of conversion, and he has further shown that there



UBER STREET, NOW LANTERN LANE, AFTER THE TRANSPORTATION

is a profitable field for the renovation specialist. This is evidenced by the fact that since Lantern Lane has been completed several similar renovations have taken place. One is known as Sansom Gardens; another, a demolition and reconstruction project, is known as the Old English Village; while a third, and the most elaborate, conversion is Panama Street, on the fringe of the fash-

ionable Rittenhouse Square district. Here the entire street has been bought and converted from cheap dwellings and illegal tenements to high-grade, artistic residential homes. There can be no doubt that old properties near good neighborhoods may be rehabilitated with profit, and what has been done in Philadelphia may be duplicated in other cities having like conditions.

Relation of Roadway Widths and Transit Lines to Street Traffic

By Harland Bartholomew

City Plan Engineer, St. Louis, Mo.

ALL roadways for modern traffic should have widths based upon the number of lines of traffic to be accommodated. Failure to adapt paving designs to the changed demands of vehicles has cost many millions of dollars in taxpayers' money and has introduced unnecessary complications into the traffic problem. In one moderate-sized city of the Middle West, the City Engineer is still laying 30- and 40-foot pavements in residence districts when 26- and 36-foot widths would accommodate respectively three and four lines of vehicles just as well. In the last five years the excess pavement charge against that city is estimated at no less than \$125,000. Excess pavement, while not of serious importance as far as traffic in residential districts is concerned, becomes a great annoyance in congested centers. It invites disregard of parking rules and is a frequent cause of traffic accidents. It also reduces sidewalk space unnecessarily. A roadway of excessive width which may actually be only wide enough for four lines of vehicles seems to be capable of carrying five or of accommodating parked cars at all angles to the curb. The uncertainty which results from such conditions hinders the enforcement of proper traffic rules.

Careful study of roadway widths in congested centers will frequently show that a slight change here and there either in parking rules or in the roadway itself will make an appreciable difference in the flow of traffic. The pavements in the business district of Chattanooga were not designed for angular parking, but practically every street was so used. Vehicular movement was seriously impeded and traffic conditions intolerable. Market Street, which carries a double-track car line

and which should be a commodious six-line thoroughfare, was reduced to a two-line street, automobiles of all kinds and street cars using the line occupied by the rails. The institution of parallel parking has cleared the street-car right of way and opened up two new channels for other vehicles. Broad Street, in the same city, a 126-foot street, has a 96-foot roadway and is theoretically capable of carrying ten lines of vehicles. Unsystematic parking on sides and center, however, has reduced this street to a two-line thoroughfare. Chestnut Street, with a four-line roadway, because of careless angular parking, at times becomes so badly blocked that automobiles must be moved upon the sidewalks to clear the street.

These are cases in which roadways properly designed for certain uses become extremely inefficient through misuse. In the case of the Washington Avenue pavement in St. Louis, laid when the street was recently widened, it was found that a 50-foot roadway with double-track car line, while theoretically and actually capable of accommodating six lines of traffic, did so at such a loss of speed as to affect seriously the capacity of the street as a carrier. In order to reduce the hazard of passing between parked vehicles and street cars and thus to increase the traffic flow, the curbs were set back 3 feet on either side. The 56-foot pavement now passes approximately twice the number of vehicles per hour.

Improper Routing of Transit Lines

The improper routing of transit lines is a common source of trouble in congested centers. Left-hand turns are frequently made directly across the flow of traffic on the busiest street. The delays thus caused react unfavor-

STREET DESIGN

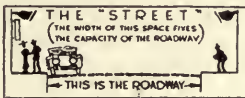
IN PLANNING NEW STREETS AND RECONSTRUCTING OLD ONES TO MEET REQUIREMENTS OF MODERN TRAFFIC OBSERVE THE FOLLOWING PRINCIPLES.

DEVELOP SYSTEM OF MAJOR STREETS - WIDE DIRECT THOROUGHFARES

RELATE ALL STREETS TO TOPOGRAPHY SO THAT EASY GRADES MAY BE SECURED AND ALL STREET FRONTAGE MAY BE USED

ASSIGN WIDTH TO STREETS ACCORDING TO VOLUME OF TRAFFIC THEY ARE TO BEAR BASE WIDTH ON NUMBER OF LINES OF MOVING AND STANDING VEHICLES ULTIMATELY TO BE ACCOMMODATED.

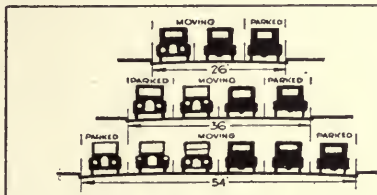
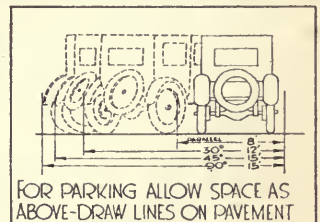
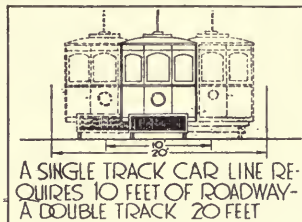
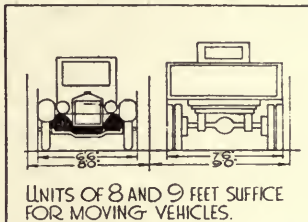
ADJUST ROADWAY AND SIDEWALK PROPORTIONS OF EACH PARTICULAR STREET TO NORMAL DEMANDS.



SEVERAL EXAMPLES ARE SHOWN BELOW TO ILLUSTRATE THE INTERRELATIONSHIP OF STREET AND ROADWAY WIDTHS AND TRAFFIC REGULATIONS.

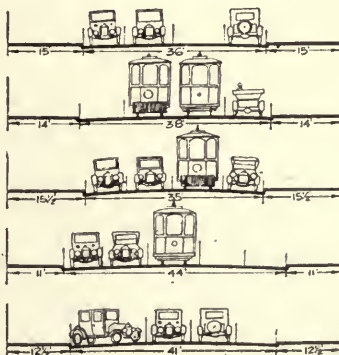
IN ANALYZING THE DIAGRAMS IT SHOULD BE BORNE IN MIND THAT THE "STREET" IS THE ENTIRE SPACE BETWEEN PROPERTY LINES

STANDARDS FOR ROADWAY DESIGN AND TRAFFIC REGULATION



A 3 LINE ROADWAY (26 FEET) IS STANDARD FOR QUIET RESIDENTIAL STREETS. A MINOR STREET WITH SOME THROUGH TRAFFIC OR CONSIDERABLE PARKING SHOULD HAVE A 4 LINE ROADWAY (36 FEET) GREATER WIDTH OF ROADWAY IS GENERALLY WASTED UNLESS THE STREET IS MADE A FULL 6 LINE THOROUGHFARE WHICH REQUIRES A 54 FOOT PAVEMENT.

ECONOMICAL ROADWAYS FOR EXISTING 66 FOOT STREETS.



1. THE NORMAL DEVELOPMENT
FOUR LINES - PARKING PARALLEL TO CURB OR PROHIBITED ENTIRELY ROADWAY 36 FT. SIDEWALKS 15 FT

2. WITH DOUBLE CAR TRACK
FOUR LINES - ALL MOVING - NO PARKING
ROADWAY 36 FEET, SIDEWALKS 14 FEET EACH

3. AS ABOVE ONE TRACK REMOVED
ONE WAY STREET - TWO LINES MOVING - PARALLEL
PARKING ON EACH SIDE ROADWAY 35 FEET, SIDEWALKS 15 1/2 FEET

4. SINGLE CAR TRACK IN CENTER
FIVE LINES TWO STANDING PARALLEL TO CURB -
THREE MOVING - ROADWAY 44 FEET, SIDEWALKS 11 FEET

5. VARIATION OF NUMBER ONE
ONE LINE PARKED AT 45° - ONE LINE PARALLEL
TWO MOVING ROADWAY 41 FEET, SIDEWALKS 12 1/2 FEET

HARLAND BARTHOLOMEW
City Plan Engineer St Louis Mo 1923

ably upon all traffic on that street and upon cross-streets. A slight change in routing which would not inconvenience the riding public would entirely eliminate many of these left-hand turns at strategic points and bring the remainder at corners not so important.

In Toledo the transit routing plan prepared for the city proposed the removal of car lines from alternate parallel streets in the business districts, so that each type of carrier might have its own thoroughfare. The movement both of automobiles and of street cars through the congested center would thus be greatly facilitated. Such a separation of street-car and automobile routes is highly desirable and should be undertaken at every opportunity. It is practically impossible to make effective use of street space so long as the flow of traffic is unsystematic.

One great contributing factor in the problem of street congestion is the unscientific street plan possessed by most cities. Unsystematic routing of traffic is frequently due to the lack of suitable streets. The automobile seeks direct routes, and few of these are available in the average city. Even more difficult than the unscientific apportionment of roadway spaces in relation to lines of travel, is the unscientific width and arrangement of streets that might be expected to afford a satisfactory scheme of circulation in any given community. A study of the traffic problem even in small communities usually discloses certain street openings, cut-offs or widenings, often inex-

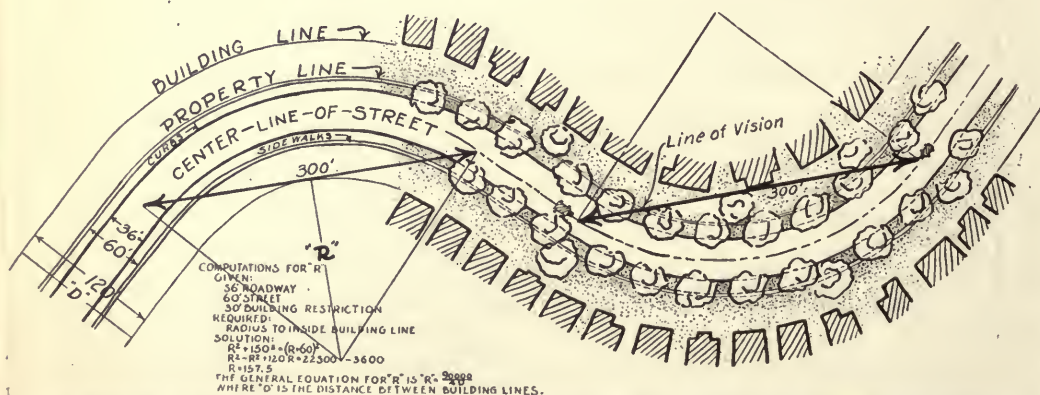
pensive, whereby new routes of travel might be opened that would afford considerable relief throughout the whole city. The development of a city plan is absolutely essential to any study of street congestion.

EDITORIAL NOTE.—A comparison of the roadway widths recommended by Mr. Bartholomew in his recent paper before the American Electric Railway Association, from which the foregoing paragraphs are quoted, and in the Street Design chart on page 475, discloses certain differences from the standards suggested by Hugh E. Young in his paper before the 1923 meeting of the National Conference on City Planning (see the Proceedings of the Conference, or the 1924 Municipal Index, page 279). Mr. Bartholomew, for example, advocates a width of 54 feet for a six-line thoroughfare without car tracks, whereas Mr. Young advocates a 56-foot width except for a street laid out without consideration for the auto-bus. In reply to an inquiry from THE AMERICAN CITY on this subject, Mr. Bartholomew writes:

"The large motor-bus is occupying considerable attention these days, and it is very well indeed to emphasize the need of planning roadways for such vehicles. Our work, however, is very largely in small cities where it would be manifestly unwise from several standpoints to advocate a general adoption of the 10-foot roadway unit. We prefer to advise these cities to use the 9-foot unit, unless it appears through major street and transit studies that certain thoroughfares are likely to carry either street car or motor-bus. For roadway planning purposes the requirements of these two forms of transportation would be considered identical.

"Our policy is to urge cities to give much more careful thought than they ordinarily do to the problems of street-car and bus routing, and to put these transportation agencies where they belong from the standpoint of service to the community as a whole. When logical routes are determined, we then urge the cities further to make provision for the development of not less than a six-line roadway on all bus and street-car routes. When we have to accept a four-line roadway for the time being, we make the same recommendation that Mr. Young would make."

MINIMUM CURVE RADIUS FOR PUBLIC SAFETY



FROM THE PLATTING GUIDE OF THE BOARD OF PUBLIC LAND COMMISSIONERS, MILWAUKEE

See article on page 500 of this issue

Equipment and Costs of Small-City Fire Departments

AN inquiry regarding fire losses and fire-fighting equipment in cities of from 8,000 to 18,000 population has brought to THE AMERICAN CITY from fire chiefs the information tabulated below, as to number and salaries of full-time firemen; size, cost and date of erection of headquarters building; number of pieces of motorized equipment; feet of fire hose; number of alarms; and total fire loss in 1923. The figures as to estimated population for 1923 and area in acres have been supplied from a recent report of the Bureau of the Census.

City	Estimated 1923 Population	1922 Area (Acres)	Full Time Firemen		Headquarters			Pieces of Motorized Equipment	Fire Hose (Feet)	No. of Alarms 1923	Fire Loss 1923
			No.	Total Salaries	Size	Cost	Built				
Adrian, Mich.....	12,278	2,803	14	\$19,300	75x60		1865	5	6000	168	\$13,500
Albany, Ga.....	12,714	2,424	14	20,000	100x40	20,000	1909	5	6500	160	48,000
Albion, Mich.....	9,261	2,004	7	9,800	100x30	5,000	1884	3	4000	71	20,130
Anaconda, Mont.....	12,221	802	7	12,000	50x60	50,000	1896	3	4000	65	8,000
Ashland, Wis.....	11,334	8,182	19	26,820	70x44	25,000	1918	4	6000	248	20,457
Atchison, Kans.....	12,630	1,773	17	24,000	90x50	40,000	1912	7	8000	220	22,000
Batavia, N. Y.....	14,144	3,606	18	22,250	65x55			3	5000	128	16,784
Beatrice, Nebr.....	9,773	3,020	5	6,800	100x60	12,000	1909	2	5000	52	35,790
Bedford, Ind.....	9,206	1,157	10	15,120	60x30	4,000	1902	3	3500	168	
Bellefontaine, O.....	9,806	1,900	7	10,800	80x40	6,000	1898	2	2600	105	8,690
Billings, Mont.....	16,927	1,824	15	25,000	40x70	20,000	1896	2	5500	99	19,400
Brownsville, Tex.....	12,250	4,263	8	7,500	50x50	7,000	1908	3	4650	42	8,700
Cairo, Ill.....	15,438	1,440	12	14,500	75x25	14,000		3	5000	200	20,000
Carthage, Mo.....	10,318	2,733	10	8,800	48x50		1883	2	3000	84	14,000
Casper, Wyo.....	15,634	2,070	19	32,632				5	7900	124	21,780
Champaign, Ill.....	17,521	2,720	14	30,000	100x75	50,000	1914	5	5400	213	29,000
Chickasha, Okla.....	10,179	2,069	13	20,400	50x65	20,000	1907	4	5000	109	102,910
Collinsville, Ill.....	10,573	1,960	2	2,400	80x40	12,000	1910	2	2500	60	14,410
Defiance, Ohio.....	9,433	2,209	4	5,200	100x80	10,000		3	3200	56	50,000
Dover, N. J.....	10,643	1,600	1	1,800	75x40	10,000	1874	3	6000	100	15,000
East Youngstown, O.....	14,695	1,068	4	7,400	150x60	60,000	1912	2	1600	45	7,300
EI Dorado, Kans.....	13,830	1,231	7	12,000	70x50		1879	3	3000	101	9,000
Eureka, Calif.....	13,311	3,731	9	13,500				2	4700	130	
Elizabeth City, N. C.....	9,108	1,400	4	4,020	80x55	6,500	1895	4	7500	134	16,580
Forest Park, Ill.....	12,273	1,280	5	10,000	100x60	25,000	1918	3	3200		
Gainesville, Tex.....	9,016	4,735	4	5,560	75x40	10,000	1918	4	5000	60	12,500
Glendale, Calif.....	18,280	9,323	23	41,000	70x50	10,000	1913	6	5000	229	13,035
Goshen, Ind.....	9,890	2,830	10	12,636	44x40	5,000	1899	2	4000	113	21,572
Grand Island, Nebr.....	15,000	3,938	11	16,800	60x17			2	3600	127	864
Greenville, Pa.....	8,890	921			100x60	15,000		2	2500	38	6,000
Griffin, Ga.....	8,513	2,010	9	10,380	75x50	35,000	1910	2	6000	69	13,000
Gulport, Miss.....	8,794	6,720	7	8,760	90x25	50,000	1905	4	3500	60	9,461
Guthrie, Okla.....	11,792	2,000	11	14,602	70x50	11,000	1903		6000	91	3,276
Hattiesburg, Miss.....	13,788	6,954	15	19,320	60x40	85,000	1922	3	4000	171	42,000
Holland, Mich.....	12,792	1,830	4	6,570	70x24	4,000	1894	2	7000	96	35,000
Huntsville, Ala.....	8,164	1,280	7	750	100x50		1913	2	2500		
Idaho Falls, Idaho.....	9,230	1,913	5	8,640	70x35	3,000	1915	2	4700		22,946
Illion, N. Y.....	11,460	1,512	4	6,591	50x22	17,000	1887	4	5400	127	8,550
Independence, Kans.....	12,430	1,783	8	11,220	70x30			4	3200	84	18,805
Independence, Mo.....	12,344	2,140	7	9,060	40x25		1907	1	2000	128	18,655
Johnson City, N. Y.....	10,320	1,075	24	1,800	120x130	35,000	1900	5	5900	89	16,373
Jonesboro, Ark.....	10,199	1,920	6	7,000	90x30	8,000	1916	2	3500	79	
Keokuk, Ia.....	14,570	3,520	14	7,500	60x50	8,000	1856	3	6000	285	50,000
Laconia, N. H.....	11,153	9,500	5	7,500	60x40	10,000	1903	2	8000	172	92,000
LaGrange, Ga.....	21,165	7,752	7	6,532	40x30	4,500	1909	3	4000	72	30,729
Latrobe, Pa.....	9,799	897	1	1,200	60x25	10,000	1919	1	3500	13	1,112
Leavenworth, Kans.....	16,912	4,800	17	22,740	81x26			4	3400	272	23,414
Mankato, Minn.....	13,225	4,301	10	15,000	90x45	20,000	1898	6	6000	173	36,000
Marlborough, Mass.....	15,189	13,435	9	16,425	85x50	35,000	1909	4	5650	148	19,510
Merrill, Wis.....	8,068	3,195	10	12,000	54x32	12,000	1915	3	6000	133	12,968
Millvale, Pa.....	8,091	400	2	3,500	58x35	15,000	1900	3	6000	106	12,000
Modesto, Calif.....	11,118	1,937	14	21,000	100x50	30,000	1909	5	8000	97	5,180
Monmouth, Ill.....	8,116	1,440	5	6,500	70x40	12,000	1886	5	4000	97	22,000
Monroe, La.....	13,639	3,086	24	31,800	60x45	20,000	1909	5	7500	131	56,000
Monroe, Mich.....	13,260	4,500	11	22,000	65x34	1,200	1852	4	2700	127	7,500
Mt. Vernon, Ill.....	10,466	1,520	2	3,000	60x40	800	1904	1	2000	74	25,000
Murphysboro, Ill.....	11,862	2,370	6	9,000	100x100	35,000	1882	3	2000	143	57,000
Norfolk, Nebr.....	9,572	1,140	4	5,880	50x48	6,000	1886	2	4300	61	17,692
Oneida, N. Y.....	11,343	14,350	8	12,720	40x28			4	100	80	15,842
Parsons, Kans.....	17,313	2,600	17	26,000	70x50	5,500	1906	3	4500	173	61,000
Phoenixville, Pa.....	10,484	1,467	4	4,920	90x30	20,000	1900	3	3800	44	3,262
Plattsburgh, N. Y.....	10,909	3,333	6	7,100	48x48			2	4800	108	23,000
Pocatello, Idaho.....	17,123	1,828	13	25,980	80x35	15,000	1905	4	7000	114	7,763
Provo City, Utah.....	10,800	7,104	7	10,000	75x50	20,000		4	4200	72	1,800
Rahway, N. J.....	11,655	2,582	9	17,000	55x48		1887	3	5500	130	55,000
Red Wing, Minn.....	8,637	4,627	11	14,670	70x45	30,000		3	6000	110	21,513
Rome, Ga.....	13,667	1,968	22	27,000	100x50		1906	7	8000	162	
San Angelo, Tex.....	10,050	4,794	11	8,300	120x50	15,000	1910	4	4300	86	19,000
Santa Rosa, Calif.....	9,098	1,310	6	9,415	80x40	13,500	1907	3	4500	88	33,464
Shelbyville, Ind.....	9,773	985	8	11,388	110x60	24,000	1916	2	6100	88	6,280
Sheridan, Wyo.....	9,465	1,466	8	12,480	50x30	8,000	1912	3	4200	50	9,419
Streator, Ill.....	14,968	2,076	12	18,000	65x50	3,500	1900	2	4000	156	35,000
Thomasville, Ill.....	8,725	2,010	7	10,189	48x65		1883	2	5350	85	4,049
Virginia, Minn.....	15,300	5,671	32	30,600	75x75			4	6500	83	17,600
Waynesboro, Pa.....	10,627	1,495	2	2,213	95x50	14,000	1889	3	3500	95	16,372
West Frankfort, Ill.....	10,772	800	2	3,600	80x40	2,000	1922	1	2500	65	32,000
W. Palm Beach, Fla.....	12,151	9,582	17	22,770	65x38	10,000	1905	6	5800	38	15,223
Willimantic, Conn.....	12,726	2,870	9	11,462	56x35		1886	3	6500	128	42,106

The Street-Lighting Demonstration at Columbus, Ohio

By M. S. Hopkins

Consulting Engineer; Chairman, Street-Lighting Committee, Chamber of Commerce, Columbus, Ohio

EDITOR'S NOTE.—Columbus, Ohio, is at present a veritable outdoor laboratory for testing street-lighting units of different kinds, equipment and make, under actual operating conditions.

The Chamber of Commerce of that city, realizing the desirability of better street lighting, took up the matter and induced a number of manufacturers of street lamps and standards to install such devices along various Columbus streets—both business and residential—so that they can be seen and judged by the public as they would appear if adopted there.

Columbus is particularly fortunate in this matter. There has never before been such a demonstration on a scale comparable with this, and it is very doubtful if there will be another. The cost of installing these units totals thousands of dollars, and the expense is so great that it is improbable that the exhibiting companies, which are paying the cost, will consent to do it again.

This installation affords an excellent opportunity for committees or individual citizens of other cities interested in better lighting for their own community to see these different types in operation by visiting Columbus.

By arranging for the showing of these units in actual operation, the Columbus Chamber of Commerce hopes to hasten the adoption of a modern lighting system by the city. It named M. S. Hopkins as consulting engineer. His comments on the demonstration are given in the following article.

COLUMBUS, one of the youngest of the modern cities of the Central West, which has experienced a phenomenal growth and now stands as one of the prominent commercial distributing points of the country, is striving to become one of the best-lighted cities in America. Its present lighting system is obsolete and inadequate for the capital city of Ohio. There are eight varieties of lighting units, including about 1,250 of the five-globe cluster incandescent fixtures used to decorate more than to illuminate the business section. For the residential and remote business districts, low-power pendant arcs and incandescent lamps are used.

Mayor Thomas, who is now serving his second term as chief executive of the city, advocated during his first campaign a general and thorough improvement in all public utilities of the city, especially the street-lighting system. Soon after his election, in conference with Colonel Edward Orton, then President of the Chamber of Commerce, and W. H. Duffy, Director, Public Service Department, it was openly admitted that Columbus was poorly lighted for a city of its size, and that steps should be taken at once with a view to modernizing its street illumination. At the suggestion of Colonel Orton, a committee of the Chamber of Commerce was appointed, with the writer as chairman. In April, 1922, this committee began its work. Instead of taking a junket about the country, visiting various cities where different types of modern street lighting are in-

stalled, such as New Orleans, Los Angeles, San Francisco, Salt Lake City, Denver, and some cities in the East, it was decided to bring the exhibits to Columbus, where not only could the committee draw better comparisons, but the people themselves could see and judge. The result has been that the General Electric, Westinghouse, Western Electric, Holophane, Massey and other electrical manufacturing companies have installed 32 different exhibits. Six distinct groups of lighting standards have been installed in the business section, and five groups in the residential section.

In the sections where the temporary new lights have been installed, the old type fixtures have been turned off so that it is easy to see and draw marked comparisons as to just what the various new lights will do. The glare, or dazzling effect, of each unit, the silhouette, or ability to see objects in outline by different lights, the best height for poles and the plan for locating them can be easily determined. The exhibits are so arranged as to show the results from two lamps to a pole, one lamp to a pole, either luminous-arc or incandescent type, located opposite one another or staggered.

Street Lighting to Be Zoned

Another outstanding feature of the Columbus plan has been the proposed zoning of the city into lighting districts and specifying wattage per lineal foot rather than candle-power for each zone. Five divisions have been made,

Exhibits on High Street, the main thoroughfare of Columbus, constitute the central business display. Here are placed single and double Westinghouse units containing Mazda



A TYPICAL SINGLE-UNIT INCANDESCENT ORNAMENTAL LAMP AND STANDARD INSTALLED BY THE WESTERN ELECTRIC COMPANY IN ITS EXHIBIT IN COLUMBUS, OHIO

namely, central business, business, boulevard, residence, and intensive business or "White Way."

For the central business section, the committee has placed a limit of 8 watts per lineal foot; for the rest of the business section, 6 watts; for the boulevard or wide-street residential section, $2\frac{1}{2}$ watts; for the remainder of the residential section, $1\frac{1}{4}$ watts; and for the "White Way" district no limitation has been placed.



A GENERAL ELECTRIC DOUBLE-UNIT ORNAMENTAL LUMINOUS ARC INSTALLED IN THE COLUMBUS, OHIO, DEMONSTRATION EXHIBIT



ONE OF THE MASSEY 30-FOOT CONCRETE STANDARDS EQUIPPED WITH HOLOPHANE REFRACTORS AND LINE MATERIALS GLASS-WARE AND 2500-CANDLE-POWER MAZDA LAMPS IN THE TWIN UNITS FOR THE WHITE WAY EXHIBIT ON BROAD STREET, COLUMBUS, OHIO

lamps of 1,000 and 1,500 candle-power on poles 16 feet high, installed opposite and spaced 110 feet apart; ornamental General Electric luminous twin unit arc lamps on 20-foot poles, spaced 135 feet apart, and single and twin Western Electric Mazda units of 1,000 and 1,500 candle-power on 15-foot poles spaced 91 feet apart in such a way as to show the light effect of single units between double or twin units.

Business section exhibits are installed on two streets, Front and Third Streets. On Front Street, the present cluster-light pole has been redesigned with a new top and base to increase its height, and 600-candle-power Mazda lamps in General Electric ornamental Novalux fixtures have been installed. These are spaced 90 feet. On Third Street, the present cluster-light pole has also been re-

modeled, giving a 16-foot height to the light center. Six-hundred-candle-power Mazda lamps, in Westinghouse octagonal Junior Reflectolux fixtures, have been installed in staggered arrangement at 45-foot distances.

The boulevard exhibits are installed on Neil Avenue, which has a 50-foot roadway. Here are two types of street lighting—the arc and the Mazda lamp. For a distance of four blocks there are General Electric luminous arc lamps, mounted on 5-foot brackets, 20 feet from the roadway. For two blocks are exhibited two types of pendant incandescent fixtures, one by the General Electric and one by Westinghouse. In each exhibit 600-candle-power Mazda lamps with light center 20 feet from the roadway, are used. These are spaced about 110 feet apart. Different kinds of globes are used to bring out different features.

The other type of residential exhibit is on Dennison Avenue, where Mazda lamps of



WESTINGHOUSE SINGLE-LIGHT POST WITH 1000-CANDLE-POWER LAMP

250 and 600 candle-power, placed 18 feet from the roadway and spaced 210 feet apart, are installed. Different type fixtures and refractors are used, including special units designed for Columbus by the General Electric Company and Westinghouse.

For the White Way, there are three exhibits, two on High Street and one on Broad Street, the latter alongside the State Capitol. One of these is the twin unit of General Electric ornamental luminous arc lamps, 135 feet apart on 20-foot poles and spaced opposite one another. The other exhibit is also of twin fixtures using 1,000- and 1,500-candle-power Mazda lamps, and is made by the Westinghouse Company. On Broad Street, a 120-foot roadway, a somewhat unique fixture has been installed by the Holophane Company. It consists of a twin unit mounted on a 30-foot Massey concrete pole, placed staggered, 2,500-candle-power Mazda lamps in Holophane refractors being used.

The History of Street Lighting in Columbus

Columbus was one of the first cities of the country to use electricity for illuminating purposes. Approximately 37 years ago the original installation was made by a corporation formed for this purpose. A contract was entered into with the City Council at a price of more than \$100 per lamp per year on a 25-year franchise basis. The company furnished all the necessary machinery for the generation of current, supplied the lamps and erected the poles and wires.

This first method of electric street lighting was very satisfactory from the standpoint of lighting only, as the open arc light was used, which, although expensive and difficult to maintain in steady operation, was more efficient in the production of light than any of its successors.

After some 25 years of periodical negotiations with the City Council over the price asked for light, the company's equipment had become so old and deteriorated that the company was compelled to ask for a decided increase in rate to help cover the cost of a new plant. This resulted in a decision by the city of Columbus to install its own plant, taking over the company's wires and poles. The municipal plant was built, and the city adopted the newly developed AC enclosed arc lamp, replacing the old open arc. However, the AC arc developed many defects and soon had to be abandoned, and replacements were made

just as fast as the city's finances would permit, with the newly developed high-candle-power incandescent lamp and the luminous arc lamp. The arc lamp adopted then was what is known commonly as the 4-ampere lamp, much smaller than the standard now used, known as the 6.6-ampere lamp.

These small arc lamps were placed principally in the northwest part of the city, and it is interesting to note that they have maintained their efficiency throughout the twelve or more years they have been used. In fact, with new electrodes, these same arcs are being used in the new exhibits on Neil Avenue.

When the Chamber of Commerce became interested, two years ago, it was felt that four watts per lineal foot should be the limitation; but this was found inadequate and was changed to 8 watts for the central business district and 6 watts for the business district. This change delayed the work a year, as manufacturers, planning exhibits, had to design special apparatus to meet the new requirements.

It is interesting to note that the work of this committee, which started in a small way, has become one of the most important studies of street lighting ever made, especially in the actual installations. So far as known, no other city has ever carried an investigation to such an extent, and any city contemplating modernizing its street lighting would do well to investigate and see the display now in Columbus.

The committee has apparently disregarded many of the older methods or precedents in street lighting, and has recognized the great difference the advent of the automobile has made in the problem of street illumination. Its slogan now is "visibility or ability to see," rather than how much light. Visibility is greatly affected by the glare from the automobile headlight, as well as from too brilliant street lights.

The different exhibits will be compared by taking the ratio of the wattage specified to the watts actually used, and the visibility will be determined by considering the direct illumination, silhouette effect, and ability to read a chart when the eye is screened with screens of different density.

To sum up the work of the committee, it has endeavored to ascertain the uncertain features of the art of street lighting and point out their possible solutions for the benefit of the taxpayers of the city.

Development of Bituminous-Base and Sand-Asphalt Pavements

By E. R. Olbrich

Of the National Research Council; recently Construction Engineer, North Carolina State Highway Commission

THE name "sand-asphalt" is obtained from the mixture of sand and asphalt utilized in recent road construction in North Carolina. However, this pavement is truly of the black-base or flexible type, the chief difference from the usual black-base being that no stone is utilized in the pavement either in the base or in the top.

The ordinary black-base construction, using an asphalt-concrete base of stone and sand and asphalt, has been standardized for some years, and is more or less familiar to engineers.

Field for Black-Base Pavements

The black-base type of pavement is ideal for passenger-car traffic and pneumatic-tired truck traffic. It will carry any volume of this traffic, but because of its flexible nature is not so well adapted to carry a large volume of heavy solid-tired truck traffic. The writer has observed that under the constant impact of heavily loaded solid-tired trucks a bituminous-base pavement, with a $3\frac{1}{2}$ -inch base and a $1\frac{1}{2}$ -inch top, gradually developed an uneven and wavy surface. Where the volume of solid-tired truck traffic is large, I believe that a concrete pavement or concrete base would be best adapted to the traffic.

Given a good subgrade, it is possible to increase the depth of the base to 6 or 8 inches, so that the base may absorb greater loads, but this would be economically out of the question on country roads. Such construction may be economical on heavy-traffic city streets, and has the advantage that the pavement on completion may be thrown open to traffic. Cuts in the pavement and repairs are quickly made.

The bituminous-base pavement generally cannot compete economically with the cement-concrete pavement except where it is possible to utilize local materials. This is due to the fact that it is necessary to heat all the ingredients in the pavement. This requires additional machinery, labor and fuel, and adds considerably to the cost. However, where it is possible to utilize local material—generally

sand—it is possible for the bituminous-base type to compete with the concrete-pavement and concrete-base types. In North Carolina the only two bituminous-base jobs let to contract were able to underbid the concrete-pavement and concrete-base types because of the presence of local sand.

Drainage and Subgrade

A bituminous-base pavement should not be constructed except where good drainage and a good soil assure a uniform, unyielding subgrade. Any settlement of the subgrade is bound to be reflected in the pavement, resulting in an irregular surface. A subgrade disturbed by frost action will produce failure in the pavement. In this respect a well-drained sand soil makes an excellent subgrade, as it is not much disturbed by frost action and affords uniform bearing.

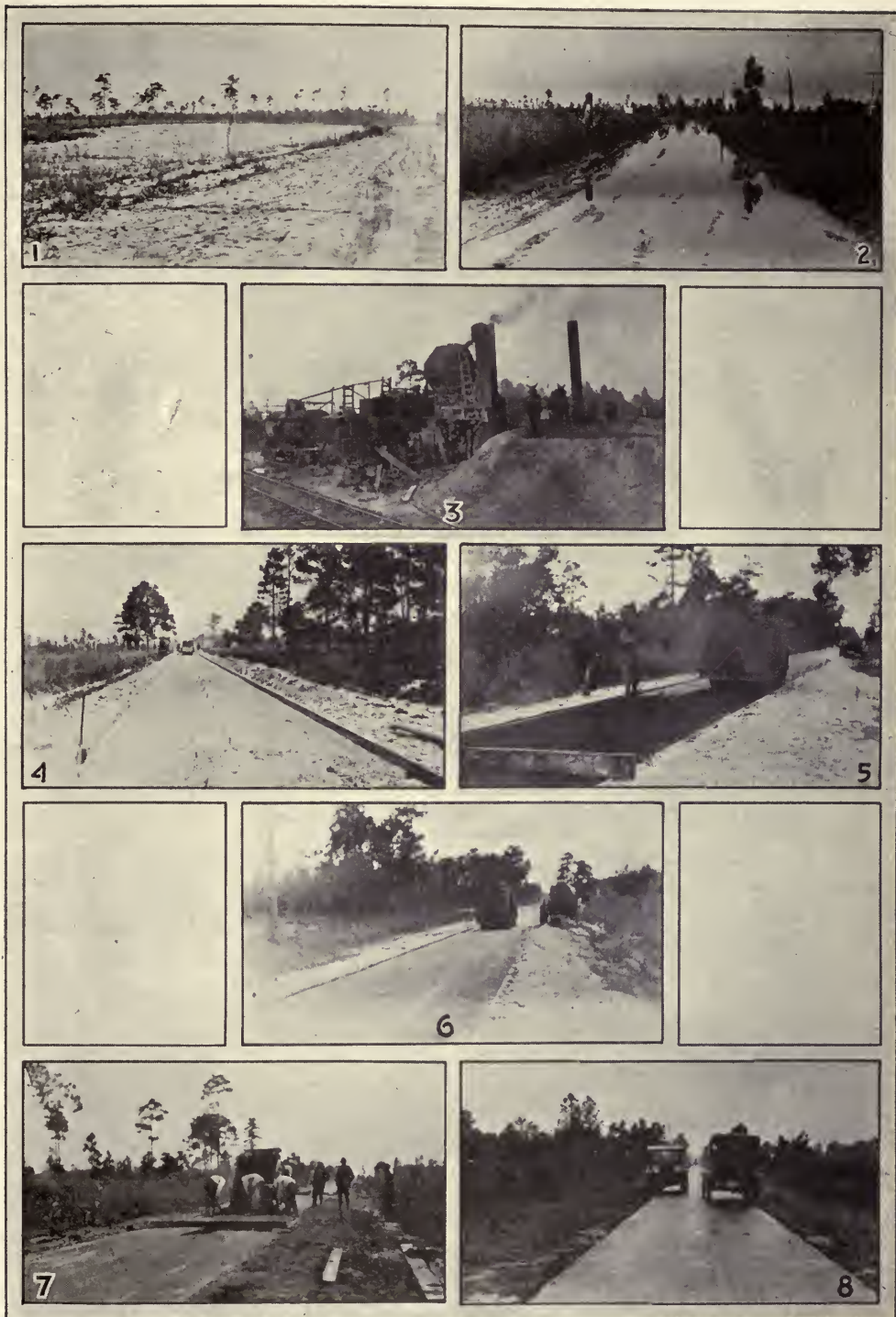
Penetration of Asphalt

The penetration of the asphalt used in mixed bituminous pavement work in North Carolina is from 40 to 50. The writer has for some time felt that the penetration of our mixed asphalt pavements could be dropped an average of 10 points or more without danger of brittleness, using a 30-40 penetration in the South and a 40-50 penetration in the North. In the case of asphalt macadam pavement a penetration of 60-70 would be suitable in the South and 70-80 in the North.

The work of the Bureau of Public Roads at Arlington in testing the stability of asphalt mixes, has shown that the penetration or stiffness of the asphalt is one of the important factors in the stability of the mixed pavements. By stiffening our asphalt in the mix, added assurance against pushing is obtained with little or no additional cost.

Forms

Wooden forms are generally used in bituminous-base construction. One of the chief causes of irregular or wavy surfaces in bituminous-base pavements is the use of warped wooden forms or woden forms badly set to



SCENES IN THE CONSTRUCTION OF BITUMINOUS-BASE AND SAND-ASPHALT PAVEMENTS

1. An old trail in dry weather, showing hard going because of sand. 2. The same trail in wet weather with equally difficult going because of water-soaked subgrade. 3. The mixing plant for the production of the sand-asphalt mixture. 4. The finished subgrade with forms in place. 5. Rolling the base course. 6. The finished base ready for surfacing material. 7. Laying the top course of the sand-asphalt pavement. 8. The finished pavement, an excellent piece of work but too narrow, causing passing vehicles to force each other out onto the shoulder

line and grade. Where wooden forms are used, 2-inch straight timber, solidly staked to line and grade, should be used and allowed to remain in place, as the forms will be found to be badly warped and bent if removed.

An experienced form-setting gang should be employed, as too much care cannot be exercised in obtaining a good line and grade of the forms. The wooden forms should not be set too far in advance of the laying of the base, for the action of the sun and rain will soon warp them.

Development of the Sand-Asphalt Pavement

The development of the sand-asphalt pavement is a story of adaptation to local conditions and utilization of local materials. Picture in your mind a sea of sand stretching for hundreds of miles along the coast of North Carolina and for some distance back inland. In many sections this sand is practically clean and free from clay or loam which might act as a binder. This clean, loose sand offers little tractive value to motor vehicles, particularly in dry weather, and offers great resistance to the passage of team-drawn vehicles. The driving wheels of a motor vehicle spin in the sand, so that it is frequently necessary to go into second or low gear for long distances at a speed of from three to eight miles per hour. There is a stretch of about forty miles of bad sand between Wilmington and New Bern, N. C., through which it takes an average of from five to seven hours to drive. Motorists prefer to make long, circuitous trips on the less sandy roads in preference to taking the direct route through the heavy sand. It may be readily appreciated that some type of road surface is necessary to lift this community, not "out of the mud," but "out of the sand." An attempt was made to haul in clay to be mixed as a binder with the sand. Owing to the scarcity and long haul of the clay, the cost was prohibitive and the result was unsatisfactory.

North Carolina's Road Problem

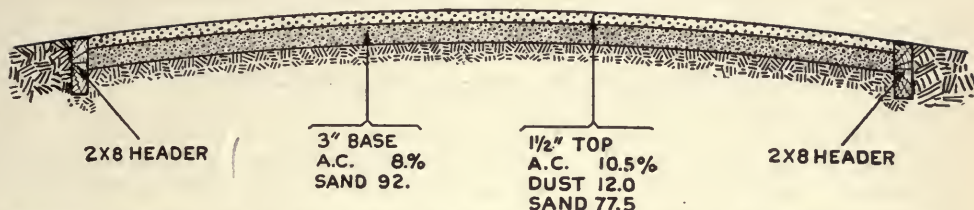
The funds available for the construction of a large system of good roads in North Carolina were necessarily limited. Gravel and top-soil are not available in this section for surfacing material. There is no stone, gravel or concrete sand available within a radius of 150 miles. The cost of shipping in sand and stone for the construction of a concrete pavement or concrete base would be a very considerable item. In addition, some of these construction projects are from 10 to 15

miles from the nearest railroad, which makes it necessary to haul the cement, sand and stone for concrete construction from the railroad siding to the job by trucks or teams. These factors made the prospective cost of concrete construction run from \$3 to \$4 per square yard. This high cost would reduce materially the mileage of hard-surface roads that it would be possible to construct with the funds available. Furthermore, the volume of traffic, except in a few instances, would not warrant the cost of a high-type concrete-pavement or concrete-base construction. The solution of the problem was in the development of some type of hard surface from the only material available—the local sand. Massachusetts, Delaware and Florida had experimented with mixtures of local sand and asphalt for road surfaces. North Carolina has developed the sand-asphalt type of construction, until at this time it is well past the experimental stage. About 40 miles of sand-asphalt pavement have been constructed by state forces in North Carolina, and a large mileage is under construction at this time, either by contract or by state forces. The pavement first constructed has been down for over one and one-half years, and has proved very satisfactory in every way.

Use of Local Material Allows a More Intensive Construction Program

The speed with which a large highway construction program may be prosecuted in any state, assuming that necessary funds are available, depends, in addition to climatic and weather conditions, on two main limiting factors: (1) the number of competent contractors available; (2) the ultimate quantity of road material available and the facilities for transporting these materials.

As long as payments are assured and there is a fair margin of profit in it for the contractor, his number will increase, so that this is not the final limiting factor, but no more hard-surfaced roads can be built than we have cement, stone, sand and gravel available at an economical cost; furthermore, these materials must be moved to the job, and railroad transportation facilities are always taxed during the peak of the construction season. Therefore, the use of 88 per cent of local materials in the construction of a hard-surface road, as in the sand-asphalt pavement, makes just that much more cement, sand and gravel available where most needed, and releases a large number of railroad cars for duty elsewhere.



TYPICAL SECTION OF A SAND-ASPHALT ROAD AS CONSTRUCTED IN NORTH CAROLINA

Investigation for Suitable Sand

If it is desired to construct a sand-asphalt surface on any given project or section of road, it is first necessary to determine whether there is sand of suitable quality present in sufficient quantities for road construction. The sandy surface of the country is generally underlain by a clay or hard-pan at no great depth, and it is necessary to seek for pockets or pits of clean sand of sufficient depth and area to provide enough sand for perhaps 10 to 15 miles of road.

Grading of the Sand:—On the the first 10-mile section of sand-asphalt construction in North Carolina, a sand-pit was found which gave a sheet-asphalt grading. The sand is practically pure silica, clean, hard and fairly angular, with a surface worn rather smooth like a beach sand. This smooth surface probably accounts for the fact that the sand will not carry quite as much bitumen as the ordinary river or pit sand found further inland.

When an investigation was made later for sand for a number of other projects in various sections, it was found that the sand available was similar in all respects to the sand used on the first project, except that it was uniformly much finer, practically all of it passing a 40-mesh sieve.

In order to conform to previous practice and experience in sheet-asphalt construction, it would have been necessary to ship in coarser sand from some distance inland to be used with the finer sand to obtain a sheet-asphalt grading. This would have materially increased the cost and defeated the purpose of the sand-asphalt construction, which was the utilization of local materials and low-cost construction. The suggestion was then made that a uniform grading be maintained between the 40 and 200 meshes instead of between the 10 and 200 meshes. The work was carried on on this basis, and the results have been entirely satisfactory to date.

The use of this fine sand without an admixture of coarse sand represents one of the most important developments in the sand-asphalt pavement, and is a radical departure

in sheet-asphalt construction. It opens up a much wider field for the use of sand-asphalt pavement, in that it provides much greater areas in which the local sand may be used.

Subgrade

The material in the subgrade, as is to be expected, is quite generally loose sand. However, outcrops and pockets of clay soil are encountered, and in one instance a project stretched from a section of sandy soil into one with a soil of rather high clay content. In such cases, the practice has been to haul in sand and place it on the clay subgrade for the full width of the grade, in order to assure good drainage. It is preferable to scarify and work the sand into the clay, as the clay acts as a binder and gives a more compact subgrade.

An important prerequisite for the success of the sand-asphalt pavement is that it shall have a uniform, well-drained subgrade. This is true of any type of pavement, and is a statement so trite that it is axiomatic, but it is of prime importance in the case of the sand-asphalt pavement or any type of black-base pavement, as it is a flexible type of surface, and under the action of traffic and temperature will conform to any change or movement in the subgrade, resulting in an irregular surface and perhaps failure. Fortunately, sand when confined offers a uniform and well-drained subgrade. It is desirable to keep the grade of the pavement as high as practicable in the low, flat country, particularly where swamps are encountered.

Location of Plant

The ideal set-up for the plant is the case in which the road parallels the railroad, and the borrow-pit for sand is along the road about midway of the projected highway. It is then possible to ship in asphalt and filler on the plant siding, and the sand is hauled from the pit to the plant by slip-teams. It is good policy to set up the plant as near as possible to the borrow-pit, so as to reduce the haul of the sand to the heating and drying unit as

much as possible. This offers ideal conditions for low-cost construction. However, it is sometimes the case that the only available sand-pit is located some distance either from the railroad or from the highway, or both.

When the plant set-up is removed from the railroad, the light portable type of asphalt plant is most practical. The asphalt must be hauled in barrels and the filler in sacks to the plant.

Where the plant set-up is removed from the project, it is found necessary to build a driveway or temporary road from the plant to the project, over which the trucks can haul the hot mix. It is impossible to get the loaded trucks through the loose sand. A driveway was built on one job, having a width of 10 feet and using a base mixture 3 inches deep after compaction, at the rate of \$2,500 per mile.

An asphalt storage tank equipped with heating coils should be a part of the plant. It reduces demurrage on tank cars and is assurance against running short of asphalt.

Plant Operation

The sand is carried by drag-pans from the borrow-pit to the stock pile at the sand drier. The mixing operation is similar to that of the usual mixed types of pavements. Average base and top mixes are indicated on the typical section.

The capacity of the small portable type of mixer was found to be about 700 square yards of 3-inch base, or 1,400 square yards of 1½-inch surface, per 10-hour day.

Hauling the Mix to the Road

The pavement construction is started at the plant, and the construction proceeds away from the plant, so that the hauling of the mix is done over the finished pavement. Therefore, it has been found economical to use light, pneumatic-tired, one-ton trucks for this purpose.

Road Operation

The finished pavement is being constructed either 10 feet or 16 feet wide. A very large mileage of sand-asphalt pavement is needed in this sandy country, and funds must be conserved as much as possible, in order to stretch them out into the greatest possible mileage. Therefore, in comparatively undeveloped sections, a 10-foot width has been adopted; whereas, in the more traveled sections near the cities and larger towns, a 16-foot width is used. If traffic later demands it, and funds

are available, it will be a comparatively easy matter to widen the 10-foot road to 16 or 18 feet.

The grade is built up 30 feet wide, whether the road is built 10 feet or 16 feet wide. It is not practical to roll the sand fills and subgrade with a large tandem or steam roller, and a grooved or ring roller has been utilized to search out soft places and give a uniform subgrade.

The forms are set by a form-setting gang and are left in place after the pavement is completed, to act as a protection to the edge of the pavement. After the forms are set, another small gang completes the fine grading. The forms should be solidly staked to line and grade, and the subgrade should be uniformly compacted before the base course is laid.

The base course mixture is delivered at the road at a low temperature as is consistent with proper raking and spreading, for it is necessary to delay the rolling until the base course has cooled sufficiently to permit satisfactorily rolling the loose-raked material on the sand subgrade. The base course is laid to a compacted depth of 3 inches. The rolling of both the base and the top course is done with an 8-ton tandem roller.

The surface course mix is laid at a uniformly high temperature of 300° F. to 350° F. to assure a good bond between the base and surface courses. Templates are used in spreading both base and top courses, and the finished surface is checked with a straight edge. The surface course is laid to a compacted depth of 1½ inches.

The average density (relative solidity) of the base course ranges between 1.85 and 1.95. No filler is used in the base course mix. The average density of the surface course ranges from 1.95 to 2.05, seldom going beyond 2.10. The average densities of sheet asphalt laid on a cement concrete base are slightly higher than these figures, probably because there is a certain amount of yielding or flexibility of the black base under the passage of the roller over the newly raked surface course. However, frequent cutting of samples, and its action under traffic, show the surface course to be an exceedingly tough, dense mix.

A close control of the asphalt mix is kept by a field laboratory in charge of an inspector and by the main laboratory at headquarters.

The sand-asphalt pavement is a development of practical highway research. The need of a community for economical highway service was met by the utilization of local ma-

NORTH CAROLINA STATE HIGHWAY COMMISSION		FORTNIGHTLY COST SUMMARY SAND ASPHALT OPERATION		DISTRICT 2	COUNTY CARTERET
		COST PER SQ. YD.		PROJECT No. 200-B	FROM OCT. 1 ST 1923 TO OCT. 15 TH 1923
Hauling sand to drier.....	\$	.079	361.90	TOTAL GROSS COST, FORWARDED.....	\$596926
Labor drying sand.....	.027	124.25	Deductions (itemize):		
Fuel oil used drying sand.....	.140	64.100	SHOULDERS.....	151.00	
Labor mixing.....	.018	82.00			
Asphalt in mix.....	.295	1392.67			
Dust in mix.....	.062	289.18			
Fuel for boiler—coal, wood, lubricating oil.....	.040	181.64			
Plant repairs, including plant engineer.....	.031	147.48	TOTAL DEDUCTIONS.....	151.00	
Railroad demurrage on asphalt tank cars.....	.027	127.00	TOTAL NET COST.....	\$581826	
Rent on asphalt tank cars.....	.010	46.00			
OTHER PLANT LABOR.....	.074	355.05			
TOTAL PLANT OPERATION.....	.810	3748.17	PERFORMANCE		
Truck drivers' pay roll.....	.032	154.50	Headers (lin. ft. of road).....	22.00	
Gasoline and oil for trucks.....	.046	222.13	Fine grading (cubic yards).....	2000 LIN. FT.	24.0
Repairs, including mechanic.....	.011	49.75	Shoulders .7 FT. width (lin. ft. of road).....		270.0
GAS OIL AND REPAIRS-ROAD EQUIP.....	.019	91.28	Base (square yards).....		488.9
TOTAL HAULING TO ROAD.....	.109	517.66	Wearing surface (square yards).....		373.1
Headers, labor.....	.027	130.00	Number working days.....		1.3
Material in headers.....	.065	308.62	Number days worked.....	108 HOURS	1.2
Fine grading, labor.....	.035	166.60	Delays and cause (use back of sheet if necessary):		
Laying, raking, and rolling hot mix.....	.105	503.35			
Shoulders.....		151.00			
TOTAL ROAD OPERATION.....	.263	1259.57			
Extra work (describe).....			Total net cost, \$ 5818.26.....	= \$ 1.25... Cost per square yard.	
			Sq. yds. wearing surface.....		
			TOTAL NO. SQ. YDS. LAID TO DATE.....	37884.0	
			PERCENTAGE OF TOTAL.....	26.6	
			AVERAGE COST PER SQ. YD. TO DATE.....	\$1.38	
TOTAL EXTRA WORK.....			REMARKS:		
Superintendence and timekeeping.....	.037	1795.0			
Depreciation, plant equipment.....	.029	1372.2			
Depreciation, road equipment.....	.012	616.1			
Interest.....	.013	655.3			
Miscellaneous.....					
TOTAL INCIDENTALS.....	.092	4438.6			
TOTAL GROSS COST.....		\$596926	COMPILED BY.....		Resident Engineer.

COST SUMMARY FOR THE CONSTRUCTION OF SAND-ASPHALT ROADS IN CARTERET COUNTY, NORTH CAROLINA

terials. The three essentials of practical highway research are:

1. Recognition and understanding of the problem
2. Solution of the problem
3. Placing of the information obtained in the hands of those to whom it may be of value

The purpose of the Advisory Board on Highway Research, with which the writer is now associated, is to bring together the various agencies active in the investigation of problems in highway engineering and transport, in order that they may correlate the results of investigations already made, and to make plans for a program of research of urgent highway problems. Each organization will then concentrate its efforts on research along lines for which it is peculiarly adapted. The results can be translated and published in a form suitable to the highway engineering and transport field at large. The Advisory Board will act as an exchange to disseminate

information and data obtained in the field of highway research.

Shoulders

With a 10-foot width of pavement, it is necessary for vehicles in passing to turn off the pavement with the wheels on the right side of the car. On account of the loose sand which composes the shoulder material, this has an element of danger for the thoughtless driver who does not slacken speed in passing. Therefore, every effort is made to encourage the growth of a tough, wiry native grass as a sod on the shoulders. In some places the grass would not take hold, and clay was hauled along the edges of the pavement and mixed with the sand to act as a binder.

Cost of Pavement

Accurate cost records of the sand-asphalt pavement have been kept, and a reproduction of one of the fortnightly cost reports is given above.

This report was made up so as to give the cost of (1) the plant operation, (2) hauling the mix, and (3) the road operation. Any work not directly chargeable to pavement operation, such as clearing and grubbing, extra-heavy fine grading, special drainage provisions, etc., is separated as "extra work."

The cost of the first 10 miles of sand-asphalt finished was \$1.37 per square yard without the shoulder work. This figure includes allowance for interest, depreciation and overhead. The shoulder cost was about 10 cents per square yard, or about \$700 per mile. Of four jobs now in operation, the average cost to date varies from \$1.30 to \$1.80 per square yard.

The total cost of plant, camp, hauling and road equipment, and accessories necessary to properly outfit a job of this kind, is from \$22,000 to \$25,000. Of this, about \$12,000 is cost of plant equipment and accessories. If a

larger type of plant is used, and larger trucks, the total cost may greatly exceed this figure.

Conclusion

The sand-asphalt pavement properly constructed on a uniform subgrade will carry an unlimited volume of passenger-car traffic and pneumatic-tired trucks. It is ideal for this type of traffic. If the volume of solid-tired heavy-truck traffic ever becomes large on any of these roads, it will doubtless be economy to build a cement-concrete pavement or base; but in the meantime the sand-asphalt pavement will have rendered many years of service at a low cost.

The sand-asphalt pavement has great possibilities of development, wherever unlimited local sand is available—along the Atlantic and Gulf Coast, in some of the lake states, and in the desert sections of some of the Western States.

Copper Sulphate Treatment of a New England Water-Supply

By E. Sherman Chase

Sanitary Engineer, Metcalf & Eddy, Consulting Engineers, Boston, Mass.

CAPE POND, the source of public water-supply for the town of Rockport, Mass., was treated with copper sulphate during 1922 and 1923 in order to control algæ growths, which give rise to the occurrence of objectionable tastes and odors. The methods employed and the results obtained are of interest, and the following account may suggest the value of more frequent adoption of this treatment for other water-supplies affected by algæ growths.

Rockport is located at the extreme tip of Cape Ann, about 30 miles northeast from Boston. The normal population of the town is about 4,000, which is increased to about 7,000 in summer, on account of the town's popularity as a summer resort. Cape Pond is a natural body of water located about one mile southwest from the thickly settled part of the town and about one mile west from the ocean. The ordinary high-water mark of the pond is approximately 70 feet above mean tide. The pond has an area of about 43 acres and a maximum depth below ordinary high-water mark of 23 feet. Its capacity at ordinary high-water mark is about 182 million gallons, these data being based upon an actual

survey and soundings. The available storage capacity has been estimated at 85 million gallons. The pond is approximately 3,200 feet long with an average width of about 600 feet. It is one of the great ponds of the state and is therefore owned by the Commonwealth, from which the town has secured the right to take water for water-supply purposes.

The point of intake is approximately 900 feet from the northerly end of the pond and approximately midway between the eastern and western shores. The intake consists of an up-turned elbow surmounted by a wire screen and is located in 23 feet of water at the deepest point of the pond. The end of the elbow is but a short distance above the bottom. The water is pumped from the pond to a stand-pipe located on a hill back of the pumping-station. From this stand-pipe the water is distributed by gravity to the town through several miles of water-mains.

Description of Pond and Watershed

Cape Pond occupies a narrow valley, the westerly and easterly slopes of which rise rather sharply from the pond to an elevation about 100 feet above water-level. There is

no inlet of any consequence, but a small intermittent outlet finds its way through a swampy area at the western shore. At the northerly end of the pond there is an area of low, swampy land of 10 acres or less. Considerable areas of shallow water, normal depth less than 10 feet, exist at the northerly and southerly ends of the pond and near the outlet at the westerly shore. Except at these points, the shores slope sharply to deep water. Considerable soft organic deposit is present in the bottom of the pond.

The fluctuations in water-level vary from year to year, the maximum on record being a difference of 6.1 feet in 1923, representing a capacity of about 78 million gallons. The maximum high water occurs usually in the spring, and the minimum in the late summer or fall. A portion of the stored water represented by the high level in the spring flows off through the outlet, but overflow occurs only at the higher water-levels.

The watershed of Cape Pond is approximately 222 acres in area and consists mainly of glacial drift deposits with a small amount of granite ledge on the hill upon which the stand-pipe is located. In view of the absence of any sizable inlet, it appears probable that the pond is largely spring-fed from ground waters collected in, and percolating through, the glacial drift. This is of significance in considering the quality of the water and the growth of micro-organisms therein.

The watershed is of little agricultural value and, with the exception of a very few acres, is covered with underbrush, scrub pine and deciduous trees.

Microscopic Organisms

The principal complaints relative to the supply have been in connection with disagreeable tastes, odors and discoloration. These unsatisfactory qualities have occurred mainly in the summer and have given rise to a feeling of dissatisfaction among the townspeople and summer visitors. Present-day standards require that a water-supply shall not only be free from contamination but also attractive and wholesome.

The water leaching through the swamp at the northern end of the pond dissolves considerable amounts of organic matter which provides food for the micro-organisms in the pond. The life, death and subsequent decay of these organisms result in the disagreeable tastes and odors. These organisms grow best in waters rich in organic matter and particularly in ground waters which contain oxidized

nitrogen in the form of nitrate. Furthermore, sunlight is an essential requisite for their development.

In Cape Pond there are various types of micro-organisms at different seasons and in different years. One kind predominates, and then disappears, to be followed by another. Examinations made by the State Department of Public Health over a period of years show that the predominating organisms have been *Asterionella*, *Cymbella*, *Melosira*, *Synedra* and *Tabellaria* of the Diatom family; *Anabaena* and *Coelospherium* of the Cyanophyceae group; *Cosmarium*, *Protococcus*, *Scenedemus*, *Staurogenia* and *Staurostrum* of the Chlorophyceae group; and *Chlamydomonas*, *Dinobryon*, *Euglena*, *Peridinium* and *Trachelomonas* of the Infusoria group. Of these various organisms, *Asterionella*, *Tabellaria*, *Anabaena* and *Dinobryon* appear to have occurred most frequently. *Asterionella* gives an aromatic geranium or fishy odor, depending upon the intensity of occurrence of these organisms. *Anabaena* gives a grassy and moldy odor which has been likened to that of green corn, and upon death and decay produces a very disagreeable odor resembling that of a pig-pen. *Dinobryon*, like other protozoa, gives a fishy odor which is oftentimes one of the worst encountered in water-supplies.

While odors of various kinds may be present in the supply throughout the greater portion of the year, they are more apt to be present during the summer months when the organisms, upon death and decomposition, liberate the essential oils contained within their cell structures, which cause the odors. There is, however, no evidence that these micro-organisms produce sickness.

Red Water

Part of the trouble with the Rockport supply has been due to corrosion of mains and services, causing rusty sediment in the water. The trouble has occurred mainly in the hot-water pipes and has been more prevalent at the end of the summer. This rusty water not only offends the eye but causes rust spots on laundry.

Waters containing relatively large amounts of organic matter or of carbon dioxide are very liable to give this red water difficulty. The analyses of the Rockport supply show it to be high in organic matter, and soft. The few data available relative to the amount of carbon dioxide indicate that the quantity present at times is sufficient to stimulate the corrosive action of the water. This prevalence of carbon

dioxide is apt to be greatest when decomposition processes are proceeding at the most rapid rate, as in the summer months, when the temperatures are high.

Temporary Remedial Measures, Pending Filtration

Filtration of the supply has been recommended at various times in the past; for example, by H. W. Spooner in 1903, Henry A. Symonds in 1919, and by Metcalf & Eddy in 1922. Aeration as an adjunct to filtration has also been advised. Temporary remedial measures were advised during the summer of 1922, pending the installation of a filtration plant. It was suggested, therefore, that an attempt be made to control micro-organisms in the pond with copper sulphate. It was pointed out, however, that such a measure was only temporary and one not to be depended upon for permanent improvement.

Survey of Pond.—In order to have accurate data for proportioning the quantity of copper sulphate applied, a survey of Cape Pond with soundings was made during the latter part of May, 1922. Prior to the completion of the surveys, the numbers of micro-organisms in the pond water had begun to increase, and complaints relative to the quality of the supply were being received by the water-works officials. In order to control these growths, it was decided to proceed with the application of the copper sulphate without waiting for the completion of the survey and soundings, using approximate estimates of the pond capacity for computing the needed dose of copper sulphate.

Application of May 22, 1922.—On this date, some 425 pounds of copper sulphate, equivalent to 0.28 parts per million ($2\frac{1}{4}$ pounds per million gallons), were applied to Cape Pond by towing bags containing this chemical from the stern of a boat rowed around the pond. Reasonable equalization of distribution was obtained by rowing more rapidly in shallow water and more slowly in deep water and also by rowing more rapidly when the bag was full of copper sulphate than when it was nearly empty.

Samples of the pond water were collected prior to the application of copper sulphate, one being taken over the intake, the second about half-way between the intake and the southern end of the pond, and the third sample about half-way between the intake and the pumping-station at the northern end of the pond. All three samples were collected at points about 1 foot below the surface. The

samples had a slight musty and fishy taste and contained distinct amounts of fine organic suspended matter.

On May 24, two days after the application of copper sulphate, samples were collected at practically the same points as those collected on May 22. The water in the pond was still distinctly turbid with what were evidently growths of organisms. The samples were examined at the laboratory of the State Department of Public Health for total numbers of organisms, numbers of genera, and numbers of principal organisms.

There was comparatively little difference in the total numbers of organisms or in the predominating types. The samples collected May 24 showed somewhat higher total counts than those collected on May 22, due mainly to an approximately 100 per cent increase in the numbers of *Anabaena*. *Asterionella*, however, were materially reduced and organisms of the protozoan types were practically eliminated. Subsequent samples, collected on May 26, showed a total number of organisms less than one-half those present in the samples of May 22, and *Anabaena* about one-fourth the number present in the samples of May 24.

This first application of copper sulphate had no effect upon the fish life of the pond, and although the turbidity of the surface water continued to be distinct, that drawn from taps in the village had become satisfactory in so far as appearance and tastes were concerned.

Application of May 27, 1922.—In view of the failure of the copper sulphate to bring about a greater decrease in microscopic organisms and in view of the relatively small amount of copper sulphate first used, it was considered advisable to make another application, which was done on May 27 in a manner similar to that of May 22. The total amount of copper sulphate applied at the time of this second application was about 920 pounds, equivalent to 0.6 parts per million (5 pounds per million gallons).

The samples collected on May 26 represented the condition of the water prior to this second treatment. Samples were collected on May 29 and others on June 8, twelve days later. As in the case of the samples collected two days subsequent to the first application, the samples of May 29 after the second application showed a distinct increase in total numbers of organisms, but at this time *Asterionella* increased as well as *Anabaena*. The samples collected June 8, however, showed a marked reduction in total numbers of organisms, and *Asterionella* and *Anabaena* were practically absent.

It is interesting to note that in both cases the treatment was not followed by the immediate destruction of the organisms. It appears probable that this retardation of effect was due to the time required for the diffusion of the copper sulphate throughout the water. Had it been feasible to row the boat in lines closer to each other, the original application would have been more uniform, and more rapid results would probably have been secured. It is probable also that the effect would have been obtained more promptly had the chemical been dissolved in water and sprayed over the surface of the pond, but this would have been somewhat more difficult and would have involved greater expense.

The second application followed the first so closely that the accumulated quantity of copper sulphate in the pond water was equivalent to about 0.88 parts per million ($7\frac{1}{4}$ pounds per million gallons). This amount of copper sulphate not only resulted in the destruction of the majority of the micro-organisms, but also brought about the death of considerable numbers of white perch. The first dead fish were noticed on Sunday, May 28, the day following the second application.

The fish killed consisted exclusively of white perch, although fish of other species are said to be present in the pond. According to data given in Whipple's "Microscopy of Drinking Water," the limit of copper sulphate application to avoid killing perch is 0.75 parts per million, an amount exceeded by about 0.1 parts per million by the combined applications of May 22 and May 27. Inasmuch as the dead fish were removed from the pond daily, no harm resulted from their deaths; in fact, the destruction of such numbers of fish may have discouraged fishermen from visiting the pond and in this way lessened to some extent the danger of contamination. It should be noted that these first two applications were made prior to the availability of accurate data relative to the capacity of the pond, and for this reason the best proportioning of the dose could not be secured.

Throughout the summer of 1922, frequent samples of the supply were collected and microscopical examinations were made by the State Department of Public Health. A study of the counts of microscopic organisms over a period of six years shows:

First, there have usually been two periods of high counts during the year, the first period occurring in May and the second in the fall, about October. Second, the predominating organisms at these times of high counts have

been of the Diatom class, organisms which give aromatic odors. Third, during 1922 the spring peak was kept low, apparently by the application of copper sulphate in May. The small peak in July, 1922, was due to the presence of *Monas*, an organism of the protozoan type which has not ordinarily occurred in the supply in large numbers. This prevalence of *Monas* was evidently the effect of the copper sulphate treatment, producing the right environmental conditions for this type of organism.

Application of November 3, 1922.—The counts of microscopical organisms remained low during the summer and early fall. Samples collected during August, however, showed a marked increase in total numbers, principally Diatoms. As the numbers of organisms appeared to be increasing, it was considered advisable to treat the pond again with copper sulphate, and such application was made on November 3. Some 700 pounds of copper sulphate were used, equivalent to 0.5 parts per million ($4\frac{1}{4}$ pounds per million gallons).

The effect of this dose of copper sulphate was not so marked as in the case of the second application of May 27. However, the November application resulted first in checking and finally in materially reducing the growths, so that no further tastes and odors were experienced subsequent to the treatment.

Treatment of August 14, 1923.—Frequent microscopic analyses of the supply were continued throughout 1923. The gradual increase in prevalence of organisms during the summer led to the application of 838 pounds of copper sulphate to the pond on August 14. This quantity was equivalent to 0.71 parts per million by weight, or slightly less than 6 pounds per million gallons. This treatment resulted in a distinct reduction in the numbers of organisms present in the pond water. The reduction in the numbers of Diatoms was particularly marked, although there appeared a slight increase in the numbers of green algæ and infusoria, as shown in the samples of August 29 and September 4. Samples collected somewhat later, on September 18 and 24, showed very low counts with respect to all types of organisms.

As in the case of the applications of 1922, the fullest effect of the treatment did not occur until some time subsequent to the date of application, probably because of the somewhat slow diffusion of copper sulphate throughout the entire body of water constituting the pond.

As previously mentioned, the second application of copper sulphate in 1922 was followed

RESULTS OF COPPER SULPHATE TREATMENT AS SHOWN BY REDUCTION IN CERTAIN PRINCIPAL AND TOTAL MICROSCOPIC ORGANISMS PRESENT IN CAPE POND WATER

Before Copper Sulphate Treatment									
				Blue Green Algae (Cyanophyceae)		Green Algae	Infusoria	Total Organisms	Total Genera
Date 1923				Diatoms					
North End	.....	July 30	.....	908	38	42	36	1,028	12
South End	.....	July 30	.....	1,036	32	82	16	1,166	10
Intake	.....	July 30	.....	878	22	52	10	962	8
North End	.....	Aug. 6	.....	692	48	4	4	754	10
South End	.....	Aug. 6	.....	392	48	2	6	448	5
Intake	.....	Aug. 6	.....	710	66	2	22	800	8
North End	.....	Aug. 13	.....	492	48	102	18	660	7
South End	.....	Aug. 13	.....	672	56	14	20	762	8
Intake	.....	Aug. 13	.....	528	64	26	14	632	7
After Copper Sulphate Treatment of August 14									
North End	.....	Aug. 20	.....	126	18	14	6	164	9
South End	.....	Aug. 20	.....	186	10	12	0	210	7
Intake	.....	Aug. 20	.....	170	2	8	2	180	4
Tap	.....	Aug. 29	.....	14	68	64	130	278	10
Cape Pond	.....	Aug. 29	.....	8	104	104	152	368	10
North End	.....	Sept. 4	.....	6	38	50	86	182	10
South End	.....	Sept. 4	.....	2	30	62	116	210	9
Intake	.....	Sept. 4	.....	4	6	40	116	168	9

August 14, 838 pounds copper sulphate, 0.71 parts per million applied.

by the destruction of considerable numbers of white perch. In 1923 no fatality occurred among the larger fish. Numerous minnows, however, inhabiting the shallow portions of the pond, were killed.

On only two occasions in 1923 did the numbers of organisms exceed 1,000 per cubic centimeter. At these two times the predominating organisms were Tabellaria and Asterionella, which do not cause unpleasant tastes and odors unless in excessive numbers. It is also interesting to note that the total numbers of organisms present during 1923 have been maintained, on the average, much lower than during any of the previous five years. The copper sulphate application of August 14, 1923, checked the tendency for increase in organisms. The experience of 1923 indicates that if the numbers of organisms can be kept below 1,000 per cubic centimeter, there will be comparatively little trouble from tastes and odors from such growths. It is true, however, that smaller numbers of certain organisms might give rise to trouble, but Cape Pond does not seem to be subject to these particular organisms.

Cost of Treatment

The cost of the copper sulphate treatment, exclusive of engineering services, was about \$160 during 1922, made up of the cost of 2,045 pounds of copper sulphate at 6¾ cents delivered and of the service of one boatman on two days and of two boatmen on the third day. In 1923 the cost, exclusive of engineering, was about \$65, made up of the cost of 838 pounds of copper sulphate and the services of two boatmen for one day.

Flushing of Water-Mains

During the latter part of July, 1922, complaints were received relative to the occurrence of a distinct odor and a brownish sediment in the water. These complaints were fairly well distributed over the town. At that time, the water in the pond itself contained some odor and sediment but distinctly less than that found in the water in the town. Inasmuch as the numbers and types of microorganisms present were not such as to account for this trouble, it appeared probable that this odor was the result of decomposition of the organic matter present in the water, this decomposition going on partly in the pond and partly in the distribution system. It also appears probable that the brownish sediment was due to iron rust formed by the action of the carbon dioxide upon the iron pipes of the distribution system, this carbon dioxide resulting from the decomposition of the organic matter. It was suggested, therefore, that a systematic program of flushing dead ends of the distribution system be carried out.

The first systematic flushing of the mains was put into effect upon the first of August, 1922, and a second flushing shortly after the application of copper sulphate on November 3. At the time of the August flushing, considerable quantities of sediment were flushed out of certain hydrants, particularly those hydrants at the ends of the long mains. Following both flushings in 1922, there was a marked improvement in the physical quality of the water delivered to the consumers.

In 1923, similar flushing of the mains was put into effect twice during the year, once in May and again in August. Such action appears to have prevented undue accumulation of sediment.

Results Obtained

It is stated by C. A. Wetherbee, Superintendent of the Water-Works at Rockport, that in no prior year have there been so few complaints relative to the quality of the water as during 1923. There seems to be no doubt but that the control of the algæ growths by copper sulphate and the systematic flushing of the mains have given Rockport a supply of reasonably satisfactory physical quality, and

of a quality distinctly superior to that of other years, prior to the introduction of the remedial measures.

Acknowledgment of assistance and cooperation is due T. T. Hunter Harwood, Chairman of the Special Water Committee of Rockport; Charles A. Wetherbee, Superintendent of Water, Rockport, and A. D. Weston, State Department of Health.

ACKNOWLEDGMENT.—From a paper read before the New England Water Works Association.

The Application of Aerial Surveying to Water-Supply Problems

By C. G. Krueger

THE unparalleled growth of many American communities during the past decade has presented perplexing problems to the municipal engineer. The need for increasing the water-supply is a natural outgrowth of unprecedented expansion of the many factors involved in the complete construction of the

modern community.

Plans have been prepared for public consideration which reveal astounding capacities. In truly American style these quantities often exceed nine significant figures in extent. But this is a natural sequence when it is considered that huge areas at times distantly remote from



AERIAL PHOTOGRAPH TAKEN AT AN ALTITUDE OF 10,000 FEET

On section of air map at left property lines have been superimposed and parcel numbers indicated. The scale of the original photograph was 800 feet to the inch. The scale of this reproduction is 1,200 feet to the inch. Temporary detour made necessary by bridge reconstruction; also, change in alignment of highways, according to modern practice

the civic center whose water requirements are to be satisfied are required to furnish sufficient run-off to impound the estimated quantity of water in a reservoir.

The preliminary work calls for accurate surveys and maps of the area involved in the development. It is in this phase that aerial surveying finds its application. The coordination of the airplane, photographic research and engineering ingenuity have given a combination more powerful than the mere individual existence of the components, replete with possibilities, some of them recognized, many as yet unattained. It is significant to note that such an eminent authority as the late Nelson P. Lewis was highly impressed with the application of aerial mapping to city planning work.

Characteristics of Air Maps

The inherent characteristic of an air map is accuracy. Combined with the vivid and complete detail of the ordinary photograph is the record of true relation among the features. In a map of this type not an object is overlooked. Houses, cultivated fields, fence lines, wooded areas, are shown in their proper proportions. The air map is a permanent and complete record of the area surveyed.

Its value is considerably enhanced by the use of the stereoscope, by means of which it is possible to obtain, at leisure in the office, a comprehensive view in relief of the entire development. The ability to make a stereoscopic examination of the terrain is a convenience the advantages of which are quite apparent.

Cost of Aerial Maps

The cost of preparing maps by the aerial

method is worthy of mention. Despite the variety of equipment required to complete an aerial survey, the procedure is efficiently correlated to provide an economical service. Extensive areas can be surveyed and mapped at less cost and in much less time than by methods used heretofore. In terms of economy, the ultimate results are not possible of interpretation in dollars and cents.

Positive Records for Claim Adjustments

In water development projects an important item to be considered is the question of land damage. The data required to prepare an estimate of cost of such damage necessitate extensive investigations on the part of the field party, the records being kept in a field book. When the system is in operation, the usual litigation on the part of the inhabitants to recover the value of lost possessions is begun. The air map is a valuable asset to the defendant at this stage by virtue of being an unimpeachable record of conditions existing at the time of the survey. In comparison to field notes, aerial photographs are unquestionably more valuable and superior in all respects in the court room. The interpretation of the former is primarily a personal matter, while the field of interpreters of air maps is limited only by the ability to visualize the features as recorded on a photograph.

What ultimate developments will occur in the application of aerial photography to varied engineering problems is not a matter of hurried conjecture. The field is fertile and it is chiefly the duty of the engineer to study the subject.

ACKNOWLEDGMENT.—Illustration by courtesy of the Air-map Corporation of America, New York.

Ten Years' Progress in Public Recreation

IN the Year Book number of *The Playground*, April, 1924, the Playground and Recreation Association of America has published some interesting statistics of progress in community recreation in the last ten years, compiled from answers to a recent questionnaire to cities throughout the country. It is shown that the expenditures of cities for public recreation during 1923 totaled \$13,000,000, more than twice the amount spent during 1913. The amount issued by 33 cities in bonds for recreation purposes last year was \$10,399,661, over eight million dollars more than was issued by 20 cities in 1913.

Ten years ago public recreation leadership was reported in only 342 cities. By 1923 the number of such cities had reached 680. In spite of this encouraging progress, the Association estimates that more than 400 cities of 8,000 population or over are still without a single playground or recreation leader. That cities are awakening to the

economy of year-round provision for play is evident from an increase of 150 per cent in the number of workers employed during the entire year, their number having increased from 774 in 83 cities in 1913 to 1,925 in 281 cities last year. Considerable increases were also shown in the number of indoor and outdoor swimming pools and public bathing-beaches reported, proving that more and more cities are making it possible not only to keep cool in summer but to enjoy the exercise of water sports all through the year.

A question on municipal golf, included for the first time by the Association in its 1923 questionnaire, brought reports from 88 cities that they are now supplying this sport of country-club members at fees within the reach of those of very moderate means.

It is also gratifying to note that through the generosity of their citizens, 51 cities received during 1923 gifts of property for recreation purposes.



SHOWING THE BULGE IN THE BRICK SURFACE WHICH CALLED ATTENTION TO "SOMETHING WRONG" UNDERNEATH AND CAUSED THE INVESTIGATION

An Interesting Road Failure

Improperly Laid Concrete Foundation Causes Breaking of Brick Pavement

ATTENTION was called recently to several ridges which had developed at intervals in a modern brick pavement in an Ohio county. It was a brick road, just north of Bucyrus, laid not very many years ago, and otherwise smooth, except for these ridges, which ran from curb to curb across the pavement. Each ridge

was about 2 inches high and not wider than one or two bricks. It was not straight across the road, but took a zigzag or crooked course.

As the filler was asphalt, the defect was puzzling to the engineers of the National Paving Brick Manufacturers Association who studied it. Had the filler been cement



HOW THE BASE LOOKED AFTER REMOVING BRICK SURFACE AND SAND CUSHION

Note the thin overlap of the concrete base



ALMOST NO EXERTION WAS NECESSARY ON THE PICK HANDLE TO PRY UP THE OVER-LAPPING SECTION OF THE BASE

Note the complete disintegration of the concrete base and also the curb

grout, which is no longer recommended except where peculiar local conditions make its use advisable, one would have guessed that expansion of the surface had caused a bulge. Had there been only one of these defects, it might have received little consideration, but there were several of them in a single mile.

The state highway maintenance foreman was called on for help, and provided men and tools for the investigation. The brick surface was removed at the several places where ridges had appeared, and the sand bedding course was swept aside, revealing the concrete course. At once the mystery was solved. "Sloppy joints" in the concrete base were the cause of the trouble. In pouring the concrete for the base, it was evident that the day's run had been allowed to "peter out" to a thin edge just as the last batch of concrete had been dumped from the mixer. The next day's run started with a correspondingly thin edge pointing in the opposite direction.

During the hot weather of last summer, the base accumulated heat from day to day, getting hotter and hotter, until there was heat enough to cause pronounced expansion.

With the "sloppy joint" the expansion could not be held in compression. In each instance one portion of the base started to slip and crawl up on top of the other. The further it slid up, the more pronounced became the ridge across the surface as the base lifted a course or two of brick. When a pick was inserted under the thin lip, the concrete was found to be disintegrated and was taken out with a shovel, like so much crushed stone.

Such failures occurred years ago, but if the road had been built under the National Paving Brick Manufacturers Association specifications, this trouble would not have occurred. Under "concrete base" in the printed specifications, we find the following statement:

"At the end of each working period, a bulkhead shall be placed at right angles to the center line of the roadway and perpendicular to the surface of the pavement, to which the concrete base shall be finished (not tapered out). When work is resumed, the bulkhead shall be removed and the exposed face of the concrete wetted before fresh concrete is placed."

Had the concrete base on the Bucyrus road been constructed with such joints, the difficulties described above would never have been experienced.

A NEW USE FOR STREET FLUSHERS

Los Angeles is making money in the movies by providing "canned rain" for the film factories of Hollywood. Street flushers are farmed out to film producers who need rain when there isn't any.—*Power Wagon*.

The Well-Water System of St. Petersburg, Florida

By R. E. Ludwig

Director of Public Utilities

THE present water system of St. Petersburg, Fla., is the result of years of investigation and study of the technical phase of ground water production. Formerly, the water-supply was secured from a fresh-water lake adjoining the town, but in time this proved inadequate and became contaminated, and for the past ten years the source has been deep wells.

The ground water in this section of Florida flows in a south-eastern direction, through a honeycombed limestone formation. A shallow layer of flint, immediately above this stratum, keeps the water under pressure and prevents it from rising, except where the formation is tapped with a well.

Water-Supply Problems

St. Petersburg is situated on a narrow peninsula between the Gulf and Tampa Bay.



ONE OF THE PUMP-HOUSES OF THE ST. PETERSBURG, FLA., WATER-WORKS

and were it not for the static pressure behind the fresh water, the salt water would enter and ruin the supply. Trouble has been experienced when excessive quantities of water have been taken from wells. The water contains sulphur, which causes objectionable tastes which it is desirable to eliminate. Another problem is present each year when the population increases from 20,000 to 75,000 for a few winter months. If the water plant were designed to supply the summer population, it would be inadequate during the winter, and if designed for the maximum population, it would be inefficient in the summer unless particularly flexible. In 1921, when it became necessary to abandon the air-lift method of pumping, the three problems to be solved in connection with our new water-works were: preventing the salt water from entering the wells; eliminating the sulphur; meeting the fluctuating demand.

The wells, when pumped by air, produced about 2,000 g.p.m., and even though air at higher pressure was used, additional water could not be secured. Evidently the reason was that the air was trapped in the limestone cavities



ONE OF THE AERATORS OF THE ST. PETERSBURG, FLA., WATER-WORKS

Aerator in action in left background

and exerted a downward pressure, so that instead of raising the water, the static was actually lowered. As the town was growing at a rapid rate, it was imperative that additional water be secured.

Extensive and thorough investigations were made of all methods of procuring underground water, most efficiently; keeping in mind salt, sulphur, and flexibility.

It was decided to purchase several vertical turbine pumps to secure flexibility and economy of operation and to construct wells to the 200-foot stratum. Below this point the water becomes salty, and in the stratum above, the water is not present in sufficient quantities.

The Well Equipment

The new pumps and wells were so spaced that one well would not materially interfere with another. Each pump and well were designed to produce the desired quantity of water without lowering the water below a predetermined level. If the water were drawn below this level, the fresh water head would be lowered and the salt water would tend to enter.

The water-works is located in a residential district, so that each deep-well pump is provided with a 10- by 10-foot house, artistically designed with a green tile roof and cream paneled façades. The concrete foundation in each house supports the pump and vertical motor. The pump-bowls are set 60 feet below the surface, as it was estimated that the pumping water-level would be at that depth. The pump-shaft and the vertical motor-shaft are fastened by a flexible coupling so that the motor and pump revolve as a unit, practically noiseless, except for the hum of the alternating-current motors. As the water is pumped from the wells, it is discharged into common

headers, emptying into each of the two storage basins. In order to eliminate the hydrogen sulphide gas from the water, it is aerated. The aerator consists of a series of baffle-boards, arranged to break up the water into small particles, liberating the sulphur gas. The results obtained with the aerators are excellent, as practically all the sulphur gas is eliminated after the water has passed over them and into the receiving basins.

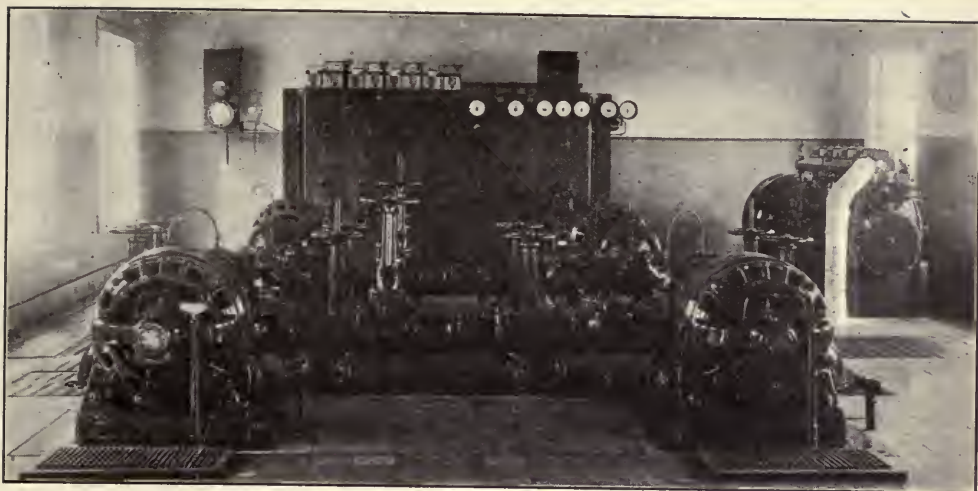
Six well units now furnish the entire water-supply for St. Petersburg. In the summer fewer units are used, but the high efficiency is always maintained.

Pressure Equipment

The service or pressure equipment is in the main pump-house. A well-designed paneled switchboard with the necessary meters and switches is located at one end of the room. A double throw switch is provided so that power can be taken either from the city power-station or from the Pinellas Power Company. Four centrifugal pumps, each of 1,500 g.p.m. capacity, pump the water from the receiving basins into the mains and an 85,000-gallon elevated tank, at 45 pounds service pressure. Between the receiving basins and the service pumps chlorination apparatus is provided, so that water is thoroughly protected from contamination. The normal operating pressure is 45 pounds, and in case of fire this is immediately raised to 90 pounds. Valves on the discharges of the pumps are arranged so that any series or parallel combination can be obtained; thus if a large quantity is needed at the normal main pressure, the pumps are operated in parallel, and when a high pressure is required, the pumps are thrown in series. Two 300-h.p. marine gasoline engines are available for fire purposes. To one of these engines is connected an electrical generator with a capac-



EXTERIOR OF MAIN PRESSURE PUMPING-STATION OF ST. PETERSBURG, FLA., WATER-
WORKS



INTERIOR OF MAIN PUMPING-STATION, ST. PETERSBURG, FLA.

ity sufficient to run the six deep-well pumps. To the other engine is connected a 6,000-g.p.m. centrifugal pump which takes water from the receiving basin or, in great emergency, from the adjoining lake, thereby affording excellent fire protection.

Recent tests on the new system showed the power consumption to be 0.42 kw. hrs., per

thousand gallons on the well pumps, and 0.54 kw. hrs. per thousand gallons on the service pumps, making a total of 0.96 kw. hours per thousand gallons, which results in a very efficient plant.

The vertical turbine pumps and well system were furnished and installed by the Layne & Bowler Company, Memphis, Tenn.

Light, the Policeman

MODERN street lighting, as a saver of life, a deterrent to crime, a protection for property and traffic at night and a developer of new civic and commercial centers, is shown in the report offered the City Manager and the Director of Parks of Cleveland by the engineers of the Nela Park laboratories to have a far greater value than most citizens ever realize.

Cleveland has had its attention called to the shortcomings of its street-lighting system a good many times during the last year, chiefly as the result of serious traffic accidents in such inadequately illuminated thoroughfares as lower Superior Avenue. The importance of good lighting in reducing robberies and other crimes of violence and in the development of backward neighborhoods is a good deal less appreciated generally.

Proper illumination may be made to serve as a sort of supplement to the police force in lessening crime, as the report strikingly demonstrates, although of course the 41 per cent difference in the amount of crime between well-lighted districts and poorly lighted ones is not to be taken at its face value; a good many other factors enter into that percentage. In the field of traffic, however, light does what not even a substantial addition to the police

department could do in the way of saving lives and lessening the chance of accident. The charts relative to accidents on such thoroughfares as Euclid, Woodland, Superior and St. Clair Avenues are not open to challenge, like those on crime, because of the difference in the character of the neighborhoods described, and demonstrate most convincingly the relation of light to safety. Night traffic accidents and fatalities along the two of these principal avenues which are poorly lighted are out of all proportion to the traffic they bear, and the lighting unquestionably is the factor which makes the difference.

Installation of the sort of lighting system the engineers recommend as adequate would involve a considerable initial outlay and would entail also an annual expense of more than twice the sum the city spends at present on street lighting. It would save a good many lives that otherwise will be taken in traffic accidents, undoubtedly. Very probably it would also have some effect on crime statistics. The difficulty is that it is not always possible to do with available city funds things which are universally admitted as advisable and beneficial. But the recommendations are worthy of the most serious consideration.

—Cleveland Plain Dealer,

Forward Steps in City and County

A Guide for Subdividers of Land

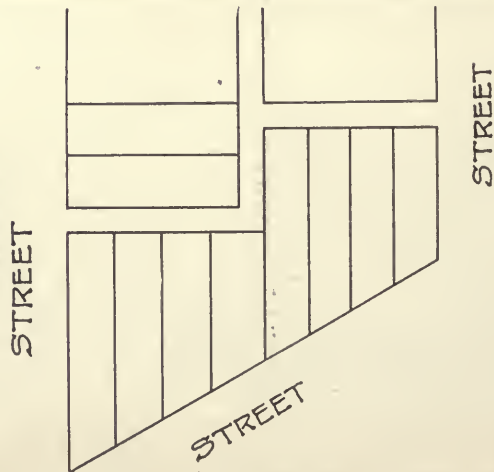
MILWAUKEE, WIS.—As an aid to owners, realtors and others who wish to subdivide land into lots, a Platting Guide has recently been published by the Board of Public Land Commissioners. The automobile is having its effect in Milwaukee, as elsewhere, and is fast developing areas heretofore inaccessible. The subdivision boom, started by enthusiastic realtors, has been taken up by the farmer to such an extent that those owning lands even as small as two or five acres in size wish to subdivide. The quantity, irregularity of size and shape, and non-conformity of ideas produce an almost hopeless condition.

All subdivision within, and for a distance of a mile and a half beyond the city limits must, under the Wisconsin statutes, be acceptable to the Board of Public Land Commissioners. The Board, therefore, has published a pamphlet setting forth such regulations as would be acceptable to that body. These regulations include the width of main and minor thoroughfares, the continuity of design, length and width of blocks and lots, the general requirements as to grades of streets, and other regulations necessary to proper platting.

Believing from past experience that mere rules would not, of themselves, be sufficient



The platting of lots as shown on sketch at right results in the development pictured above. Note the staggered house fronts, which are undesirable



for better platting, the Commissioners have devoted the second half of the pamphlet to suggestions for the development of a successful subdivision. Several reproductions of excellent subdivisions developed by the United States Housing Corporation, have been loaned, to show the proper use of topography. Other subdivisions illustrate how natural features may be taken advantage of for the benefit of the home owner. Following these, are several formulae intended to assist those surveyors not familiar with curvilinear layouts or proper curves for the safety of traffic, and, lastly, a map of the proposed county parkway, showing areas set aside for parks, for industries, and for residences. This may also include the proposed diagonals leading to and around the city, in accordance with the comprehensive thoroughfare plan.

The results of this publication were immediately noticeable, and the better quality of subdivisions has already more than repaid

the Board of Public Land Commissioners for its efforts.

GARDNER S. ROGERS,
City Planning Engineer.

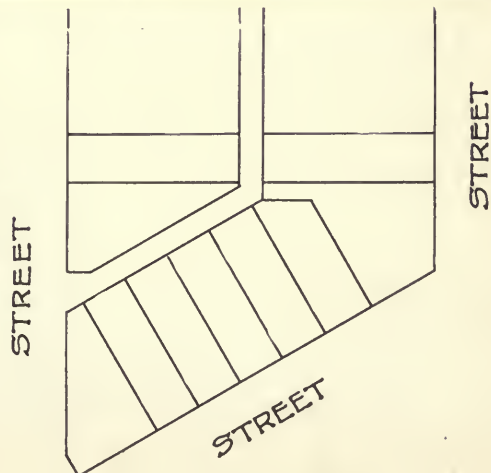
A Flood-Prevention Program

PUEBLO, COLO.—To insure the inhabitants and business concerns of Pueblo against future losses from floods arising from the Arkansas River, the Pueblo Flood Conservancy Board has undertaken an extensive engineering program, covering the next three years, at a cost of \$3,600,000. Bonds for this amount have been sold by the Board, and actual work on the project was started in January of this year.

Immediately following the disastrous flood of June, 1921, the City and County Commissioners and business men of the city secured the services of the Dayton-Morgan Engineering Company of Dayton, Ohio, to make a survey of Pueblo for the purpose of devising a feasible plan for the



A uniform set-back line is possible when side lot lines are platted at right angles to street line as shown on sketch





MOTOR-CYCLE SQUAD, PORTLAND, OREGON

protection of the city against future floods. Practically two years of engineering survey work followed, and a plan known as the Bluff Channel plan was perfected for submission to the District Court and to the citizens of the community. A hearing was conducted and a decision in favor of the adoption of the plan was rendered. Action was then taken to secure a reappraisal of property in the actual flood district and of all other property so situated as to derive a direct benefit from the proposed protective measure. This reappraisal work was carried out, and in a hearing which followed, the Board of Appraisers were upheld in their decisions on property values.

The Bluff Channel plan as adopted calls for an alteration in the course of the Arkansas River from its present channel passing through the center of the city to its natural course along a high bluff four blocks south of the present channel. This scheme will eliminate the necessity of building two levees, and, it is thought, will further aid in flood protection by allowing the river to make a straight shoot through the city instead of following the bend in the present channel. It is estimated that when the work is completed, the river will be capacitated to carry away twice the volume of water that passed through Pueblo during the last flood.

ED ORAZEM,
Pueblo Star-Journal.

Portland's Motor-Cycle Squad Does Effective Work

PORTLAND, ORE.—The motor-cycle squad of the Portland Police Department is now recognized as one of the most efficient squads of its kind in this country, and has

earned a wide-spread reputation for the effectiveness of its work in recent years. The history of this motor-cycle department dates back to 1915, when the writer was appointed the first motor-cycle speed officer in the city of Portland. Reckless driving among motorists had become a serious problem for the Police Department at that time, and the motor-cycle soon proved to be an invaluable aid in enforcing traffic regulations. During the first two and a half years about 4,000 arrests for traffic violations were made, the majority of these being speed cases. Thirteen cases were appealed to higher courts, but only one case was lost during that period.

In the year 1917 eighteen additional motor-cycle police were appointed, and this squad accomplished remarkable results not only in curbing reckless driving but in answering emergency calls. At the present time there are twenty-eight members in the squad, and it is expected that this number will be increased in the near future. The men are all equipped with Harley-Davidson motor-cycles, the type of machine which we have used since the department was first organized. We find that the best service is obtained by exchanging the used machines for new ones each year, since a speed officer's machine has to stand harder wear and cover more miles in one year than is required of the average motor-cycle in a number of years.

The Portland Police Department feels that if its motor-cycle squad were eliminated at the present time, the Department would be in a critical condition. In fact, as a result of eight years' experience in this city, the writer believes that any community, whether large or small, that is not

equipped with at least one motor-cycle officer is not only neglecting to protect its citizens properly, but is losing money as well.

FRANK ERVIN, Lieutenant,
Portland Police Department.

An Annual Trophy for Local Civic Service

FORT WAYNE, IND.—A year ago the Optimist Club of Fort Wayne decided to set apart annually \$100 with which to purchase a Civic Award Trophy to be presented to that citizen of Fort Wayne who during the year had performed the most valuable and unselfish service to his or her community; the selection to be made by a Board of Award, made up of one representative each from eighteen of the civic organizations of the city, as follows: Optimist Club, Rotary Club, Kiwanis Club, University Club, College Club, Exchange Club, Altrusa Club, Woman's Club League, Chamber of Commerce, Real Estate Board, Board of Park Commissioners, Council of Social Agencies, Board of School Trustees, Fort Wayne Art School, and League of Women Voters.

Nominations for the award must be sent in not later than December 31 of each year. The rules further provided that in addition to the winner of the trophy, five other persons from among those nominated should be selected for "most favorable mention."

Great public interest was excited and twenty-two nominations were made for the 1923 trophy, supported by briefs showing why the person nominated was regarded as the one most worthy to be chosen for the award. The first choice fell upon Bert J. Griswold, who for many years has been distinguished for his valuable and unselfish services to his community, although under the rules his services for 1923 only could enter into the deliberations of the Board of Award.

The presentation was made at an evening dinner, which included four hundred of the

leading men and women of the city, former Vice-President Thomas R. Marshall making the principal address.

No person is permitted to receive the trophy any two years in succession. For this year it consisted of an original bronze tablet, inscribed as shown by the accompanying illustration.

COLONEL DAVID N. FOSTER.

Park Acreage of 67 Cities of 5,000 to 200,000 Population

The following table has been compiled from data furnished to THE AMERICAN CITY by the respective park superintendents:

City and State	Population	Acres of Park Area	Number of Play- grounds in Parks
Lead, S. Dak.	5,013	20	8
Yankton, S. Dak.	5,024	30	..
Kalispell, Mont.	5,147	52	..
East Point, Ga.	5,241	2	2
Waverly, N. Y.	5,270	15	..
Grinnell, Ia.	5,362	30	1
Taylorville, Ill.	5,806	55	..
North Andover, Mass..	6,265	10	..
Dormont, Pa.	6,455	23	1
Newton, Ia.	6,627	7	..
Rhineland, Wis.	6,654	10	..
Freeland, Pa.	6,666	13	2
Vineland, N. J.	6,799	40	1
Wellington, Kans.	7,048	200	2
Montpelier, Vt.	7,125	75	..
Two Rivers, Wis.	7,305	48	1
Stoneham, Mass.	7,873	9	1
Dixon, Ill.	8,191	300	3
Clearfield, Pa.	8,529	15	2
Norfolk, Nebr.	8,634	40	1
Hanover, Pa.	8,664	3	2
Rock Hill, S. C.	8,809	11	5
Sheridan, Wyo.	9,175	80	..
Watertown, Wis.	9,299	17	..
Watertown, S. Dak. ..	9,400	200	4
Mt. Clemens, Mich. ...	9,488	30	..
Brainerd, Minn.	9,591	28	6
Bowling Green, Ky.	9,638	50	10
Wallingford, Conn.	9,648	25	2
Chickasha, Okla.	10,179	41	2
Abilene, Tex.	10,274	50	1
Greeley, Colo.	10,958	100	2
Texarkana, Tex.	11,480	50	1
West Chester, Pa.	11,717	9	1
Brownsville, Tex.	11,791	5	..
Cheyenne, Wyo.	13,829	106	2
Ogdensburg, N. Y.	14,609	8	..
Pocatello, Ida.	15,001	30	2
Framingham, Mass.	17,033	92	15
Norwich, Conn.	22,304	325	2
Lafayette, Ind.	22,486	100	3
Ottumwa, Ia.	23,003	155	5
Galesburg, Ill.	23,834	110	1
Irvington, N. J.	25,480	8	1
Bangor, Me.	25,978	27	2
Fort Smith, Ark.	28,870	6	..
Norristown, Pa.	32,319	52	1
Wilmington, N. C.	33,372	23	3
Pontiac, Mich.	34,273	248	1
Austin, Tex.	34,876	20	1
Poughkeepsie, N. Y. ..	35,000	90	3
Williamsport, Pa.	36,198	198	2
Springfield, Mo.	39,631	200	6
Lexington, Ky.	41,534	75	7
New Castle, Pa.	44,938	20	1
Topeka, Kans.	50,022	330	4
Long Beach, Calif. ...	55,593	450	1
Ansing, Mich.	57,327	400	3
Racine, Wis.	58,593	228	..
Rockford, Ill.	65,651	565	7
Johnstown, Pa.	67,327	240	..
Wichita, Kans.	72,217	500	4
San Diego, Calif.	74,683	2,000	..
Lawrence, Mass.	94,270	188	7
Camden, N. J.	116,309	153	..
New Haven, Conn.	162,537	1,600	12
Atlanta, Ga.	200,616	1,000	11



Power--the Municipal Problem

Diesel Engines Replace Old Steam Equipment and Meet the Needs of Smaller Communities

By Delbert Kay

THE development and growth of municipalities, particularly those with populations ranging from 1,000 to 10,000, often involves difficult problems in the furnishing of utilities, particularly electrical energy for light and power. The first step of almost every village in an attempt to obtain the enjoyments and comforts of the city is to get electric service for home lighting. With further growth, the demand for a water system necessitates some form of power to operate the pumps. As the municipality continues to grow, the power problem becomes more difficult to solve satisfactorily, not only in regard to the cost of operation to provide current at reasonable rates, but also in furnishing a service that will be reliable in case of any emergency that may arise.

For the small community where electricity is required only for lighting at night, no serious difficulties are encountered. Usually a small internal-combustion engine will be found suitable and the investment small. When the load has outgrown the capacity of equipment of this type and the demand for power necessitates the furnishing of 24-hour service, some other provision must be made for taking care of the community's requirements. Here the real problem starts, and to solve it satisfactorily means a most careful analysis by those familiar with every phase of the question. Aside from furnishing service to take care of present needs, the question of operating costs, future expansion and the correct selection of units that will assure the utmost in efficiency are all-important points that must be carefully considered.

In following the progress of small and medium-sized municipalities one cannot help but be impressed and often surprised at the decisions made in the selection of the form of power that will best serve the community's needs. Many cities that have for years maintained municipal plants are abandoning the old service that has served faithfully and as economically as was possible under the conditions, and are resorting to a new venture—that of purchasing current. This seems to be the present-day tendency—for which there must be some reason. Has the central station anything to offer in the way of lower rates? An investigation will invariably show that this is

not the case. Often municipal officials are led to believe that current can be purchased cheaper than it can be furnished by the city-owned plant. After a few months of purchased service, however, the savings that were expected usually fail to materialize. The iron-clad contracts now made by the large power companies are often misunderstood by the average city official. The meaning of the various rates, demand charges and surcharges are often more fully explained after the contract is signed and the first bills rendered.

Has the central station anything better to offer in the way of service? Many municipally owned plants are giving day-after-day service that cannot be excelled by any form of power. Purchased current brought over long transmission lines is always subject to storms and other severe weather conditions, and interruptions of supply are not unusual. These occurrences not only cause inconvenience but may prove serious, especially if the pumps for the water-supply are motor-driven. During the past winter many towns dependent upon purchased current have been without service for a number of days.

While purchased current may be suitable in some instances, there are more cases where the municipality could supply its own needs at considerable saving and with the assurance of continuity of service. Where sufficient load is available for the operation of a fair-sized unit, there is no reason why the municipal plant cannot prove profitable, providing the right kind of generating equipment is selected. It is generally believed that the water service can be furnished at a profit by the city-owned plant. If this is true, why cannot electric service be taken care of by a similar method? The opposition against municipal ownership of utilities invariably arises from a well-organized group who have their own interests at heart and not those of the community. Usually some plant is held up as a glowing example of inefficiency, but if investigation is made it will be found that the reason for this inefficiency is because of the use of equipment that is obsolete or not suited for the requirements. A plant with modern equipment is never used as a comparison.

An example of a modern municipal plant that is profitable and one that is giving good

COMPARATIVE OPERATING COSTS OF STEAM AND DIESEL PLANTS

Plant	Costs			Suppl. Maintenance	Total Cost	Output in Kw. Hrs.	Cost per Kw. Hr.
	Fuel	Labor	Lubr.				
Steam—1922	\$22,368.82	\$ 9,335.56	\$441.70	\$655.31	\$32,801.39	709,190	\$.0469
Diesel—1923	\$ 3,651.21	\$10,275.53	\$405.26	\$ 93.12	\$14,177.02	1,132,000	\$.0126
Saving in 10 months with diesel plant.....				\$18,624.27	Percentage increase in load.....		45.5
Percentage saving with diesel plant.....				56.8	Saving in cost per kw. hr. with diesel plant..		.0343
Increase in load of 1923 over 1922.....				322,801	Percentage saving with diesel plant.....		73.1

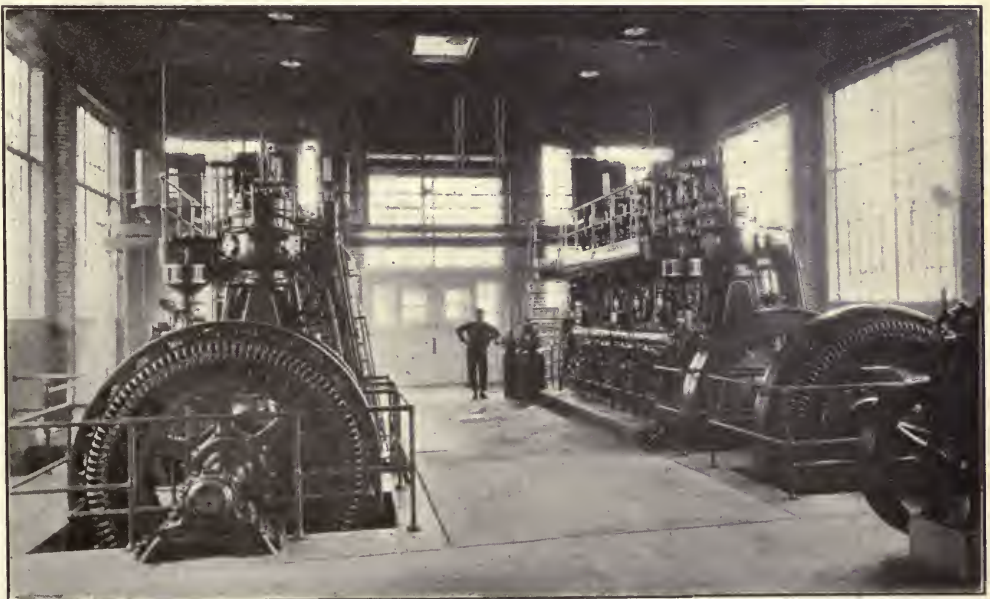
service can be found in the city-owned plant of Neodesha, Kans. This consists of two 550-b.h.p. Nordberg two-cycle full diesel engines direct-connected to 375-kw. generators. These units replace an old steam plant that had been in service for many years. The steam units were of a type similar to those usually found in municipal plants of this size and when originally installed were as efficient as could be obtained. Although the steam plant had long given faithful service, it could not be considered profitable from the standpoint of building up surplus profits to take care of future expansion.

Since the steam plant was installed, considerable progress has been made in power equipment, and efficiencies are now possible that were unheard of in the earlier days. One of the most important steps in this direction was the development of the diesel engine, a type of prime mover that utilizes the fuel directly in the engine cylinder. This eliminates many losses found in other power systems and permits an engine of moderate size to show an efficiency comparable with that of the most modern steam generating station

equipped with all the latest labor-saving and cost-reducing devices.

Instead of turning to the popular "cure-all" for municipal plant troubles, that is, purchased current, the officials of Neodesha decided first to have a careful investigation made to determine what form of power would be most suitable and what would give the maximum service at lowest cost. As a result of this investigation, two diesel engines were installed. These have now been in operation for over fifteen months. The answer as to whether or not the plant is successful can best be shown in a comparison of power costs of the steam plant for 10 months in 1922 with a corresponding period of diesel operation for 1923. See table above.

When the diesel plant was under consideration, an estimate was made by the consulting engineers to determine what the probable cost of operation would be for any condition of load. The results that have so far been obtained show a close conformity to these original estimates. In order to obtain low power costs, however, it is essential that a plant operate with a favorable load factor. The higher



AN INSTALLATION OF DIESEL ENGINES AT THE MUNICIPAL POWER-PLANT, NEODESHA, KANSAS

These two 550-brake-horse-power Nordberg two-cycle diesel engines, direct-connected to 375-kilowatt generators, operate at 225 r.p.m.

the load factor, the lower the unit power costs. The plant at Neodesha is operating under the disadvantage of a low load factor, averaging only 155 kw. for the 750 kw. installed. With this load, the total cost per kw. hr., inclusive of fixed charges, is 2¼ cents, but if the load could be increased to 500 kw., the cost could be reduced to approximately ¾-cent. The size of units installed in comparison with the actual load carried was necessary owing to the peak loads the plant must carry at certain periods.

At the present time Neodesha is enjoying a domestic lighting rate of 6 cents per kw. hr. and a power rate varying from 2 to 3 cents, claimed to be the lowest in the state of Kansas. As is usually the case when an abundant supply of reliable power is available, more use is made of the service. In 1922 there were 47 street lights in use, while in 1923 they had increased to 147. A white way of 106 lights and 22 alley lights were also added, all being of 250 candle-power. Neodesha now has

the reputation of being the best-lighted town in Kansas.

Since the engines were installed, the operation has been satisfactory in every way. The plant is now operating on a profitable basis and has proved a real investment for the municipality. During the 15 months of continuous service not a cent has been spent for engine repairs. This is quite contrary to the old impression that the diesel engine is expensive to maintain. With properly designed and constructed diesel units, the cost for maintenance and repairs is far less than that of a steam plant of similar size.

The municipality that is endeavoring to make its power-plant a municipal asset, one that will give dependable service at the lowest possible cost, can well profit by the experience of Neodesha. There are many cities struggling along with obsolete plants that are neither serviceable nor profitable. In such cases the diesel engine seems to offer the best solution of this vexing power problem.

Liability for Supplying Impure Water

By A. L. H. Street

AS to legal responsibility for injury sustained by a consumer of water on account of impurity, a city operating water-works is governed by the same rules of law that apply to private water companies. It was so decided by the New York Court of Appeals in the case of *Canavan vs. City of Mechanicville*, 128 *Northeastern Reporter*, 882. In the same opinion, the measure of responsibility is stated by the Court as follows:

"A private water company or a municipality is not an insurer, nor liable as a guarantor, of the quality of the water it furnishes to its customers by the customary means of pipes and faucets, and cannot be held liable for injuries caused by impure water furnished by it, unless it knew or ought to have known of the impurity. Its duty is that of exercising reasonable and commensurate care and diligence in providing an adequate supply of wholesome water at all times."

In the case above cited, the Court decided that the complaint stated a valid cause of action against the defendant city on account of typhoid fever contracted by plaintiff and his children from drinking impure water.

Similar conclusions were reached by the same court in the earlier case of *Stubbs vs. City of Rochester*, 124 *Northeastern Reporter*, 137, which was also based upon typhoid fever caused by drinking impure water.

Another leading case was decided by the Minnesota Supreme Court in 1910 (*Keever vs. Mankato*, 129 *Northwestern Reporter*, 158). In that case, the Court said:

"It is obvious that a sound public policy holds a city to a high degree of faithfulness in providing an adequate supply of pure water. Nor does it appear why its citizens should be deprived of the stimulating effects of the fear of liability on the energy and care of its officials; nor why a city should be exempt from liability while a private corporation under the same circumstances should be held responsible for its conduct and made to contribute to the innocent persons it may have damaged."

In the New Jersey case of *Jones vs. Mount Holly Water Company*, 93 *Atlantic Reporter*, 860, it was declared:

"Negligently furnishing water which is deleterious to the human body or health will furnish a valid cause of action to a customer injured by the use of the water. Actual notice or knowledge of the unwholesomeness of the water of the defendant company was not an essential element to be proven in order to establish the defendant's liability; it was sufficient if there was testimony tending to show that the defendant, in the exercise of reasonable care, might have discovered the unwholesomeness and dangerous condition of the water."

That contributory negligence is a valid defense to suits of this kind is shown by what

the Wisconsin Supreme Court said in the case of *Green vs. Ashland Water Company*, 77 Northwestern Reporter, 722:

"Though the conduct of the defendant be held wrongful on the ground of either fraud or negligence, if the deceased knew, or under the circumstances ought to have known, the dangerous condition of the water, yet used it with the con-

sequence complained of, no legal liability thereby attached to the defendant. If the deceased knew, and he is charged with knowledge of what a man of ordinary intelligence under the circumstances ought to have known, then he was not deceived, whatever may have been the conduct of the defendant; and for the same reason he is chargeable with contributing to the result complained of, by his own want of care."

Cesspools versus Sewers

A Comparison of Costs

THE use of cesspools for the disposal of house sewage is quite general throughout the small communities of Connecticut. Except where conditions are unusually favorable, they are, for the most part, in very poor condition. Efforts to have them replaced by a proper sewerage system are met with protests that the cost is prohibitive.

A city of about 30,000 population with an ample supply of water, but entirely dependent on cesspools for the disposal of domestic sewage, had been having considerable trouble from the overflowing of cesspools. A firm of engineers was engaged to advise them whether to build more cesspools or to install a public sewage system. They made a very thorough investigation and their report showed:

1. The subsoil was favorable to the use of leaching cesspools.
2. Installations varied from a sewage cesspool for one or two persons to a battery of 11 serving 28. An average of $4\frac{1}{2}$ persons were served by each installation.
3. Two-thirds of the cesspools had overflows through which sewage escaped when leaching through soil ceased; 25

per cent of cesspools without overflows were in poor condition.

4. Some cesspools had to be cleaned every two weeks. A few had not been cleaned in sixteen years; average time of cleaning, once every $13\frac{1}{2}$ months.
5. Cost of cleaning, \$14.00 per year per installation.
6. The estimated cost of a sewerage system and complete treatment of the sewage was \$2,665,000. The operating cost was \$1,900 per 1,000 persons, \$1,300 of which was for pumping the sewage to the treatment plant.
7. It was proposed to meet this cost by issuing $4\frac{1}{2}$ per cent serial bonds and assessing property \$1.50 per front foot and 1 cent per square foot, to be paid in ten annual installments.
8. The increase in tax rate would be:
For cesspools \$2.35 per \$1,000 valuation.
For sewers \$2.30 per \$1,000 valuation.

Conclusion

The cost of a complete modern sewerage system for any community is no greater than the cost of providing cesspools, and a great deal more sanitary.

ACKNOWLEDGMENT.—By courtesy of the *Health Bulletin* issued monthly by the Connecticut State Department of Health.

To Clean Up Unsightly "Back Yards" of Cities

A NATIONAL movement for cleaning up the unsightly "back yards" which cities exhibit to travelers along railroad rights of way has been inaugurated by the Industrial Division of the National Association of Real Estate Boards. A plan for eliminating objectionable rubbish in the great industrial tracts of cities traversed by passenger-carrying lines will be discussed at the Association's coming convention in Washington, D. C., June 3-6.

William Martin, of Philadelphia, is chairman of the Division's committee which is undertaking the clearing away, for travelers through American industrial cities, of the jungles of scrap-heaps and broken fences which now register as foreground

for smoke-stacks and warehouses. It is expected that industrial commissioners of railroads throughout the United States will cooperate with the industrial realtors in the clean-up campaign. In outlining its program, the committee emphasizes the need for greater attention on the part of many industrial concerns to the appearance of their properties visible from the right of way. Commercial associations and civic organizations in the cities will also be asked to take an active part in making the right-of-way outlook represent their cities fairly to the traveling public, and also in enabling the traveler to identify easily the town through which he is passing by the recognition of its distinctive and attractive character.

Motor Trucks and Industrial Railway Both Used on One Road Job

Long Haul Made Combination of Methods Economical in North Carolina

By R. P. Royer

Royer-Ferguson Company, Inc., Roanoke, Va.

WITH the only available shipping point one mile from the end of a concrete road job $10\frac{1}{2}$ miles in length, the haulage of materials assumes the utmost importance. These were the conditions confronting the Royer-Ferguson Company, Inc., contractor for North Carolina State Aid Project No. 533, which extends from High Point toward Winston-Salem. The method adopted

plant to the transfer point was originally sublet on a ton-mile basis, but later the equipment was purchased and operated by the contractor. The equipment used consisted of $3\frac{1}{2}$ -ton Acme and Garford trucks with Troy trailers. Each truck carried three Lakewood steel batch-boxes of the tip-over type, and pulled a trailer loaded with four more boxes. Each box contained materials for a four-sack



BROWNHOIST LOCOMOTIVE CRANE USED FOR FILLING STORAGE BINS ON HIGH POINT-WINSTON-SALEM ROAD JOB

was to haul preproportioned batches in steel boxes on motor trucks and trailers over as much of the concrete road as was opened to traffic, and then transfer the batch-boxes to industrial cars for transportation past the new pavement to the mixer.

Although the distance from High Point to Winston-Salem is approximately 22 miles, no railroad is near the highway at any place between the two cities. Materials for Project No. 533 were therefore received at a siding along the main line of the Southern Railway at High Point. Here a Brownhoist locomotive crane transferred sand and crushed stone to overhead loading bins fronting on the street, while cement was unloaded.

The contract for hauling batches from the

batch of $1:1\frac{1}{2}:3$ concrete.

To avoid turning the trailer around, the truck-trailer unit ordinarily continued past the aggregate bins and drew up at the cement shed, where four bags of cement were placed in each batch-box on the truck. The truck was then uncoupled from the trailer and driven to the aggregate bins, where stone and sand were added. Meanwhile cement had been placed in the batch-boxes carried by the trailer. The truck now backed up to the cement house, and was coupled to the other end of the trailer, which was then pulled up to receive the aggregates.

With paved streets and the concrete road to haul over, the trucks made good time en route to the transfer station, where they



LOADING ACME MOTOR TRUCKS AND TRAILERS CONTAINING BATCH-BOXES WITH SAND AND GRAVEL AT STORAGE BINS

stopped under a light gantry crane which carried a pneumatic hoist. The gantry spanned the concrete slab and the track of 24-inch gage along the shoulder. Lifting tongs suspended from the hoist were hooked into holes at the sides of the batch-boxes, and they were quickly lifted and moved sidewise to position over an industrial car truck. When enough boxes had been transferred to make up a train load, the cars were pulled to the mixer by a Burton gasoline locomotive. Eight cars, each carrying two boxes, was a standard train; on grades—and there were several

ranging from 3 to 5 per cent—this number was cut to as low as five cars.

Although the plan adopted involved an additional handling of the batch-boxes, it utilized the concrete pavement as fast as opened to traffic, and has doubtless proved economical in this instance. John D. Waldrop, Greensboro, N. C., was District Engineer in charge of the work for the state, and J. W. Mills was Senior Resident Engineer. The North Carolina State Highway Commission is headed by Frank Page, Chairman, and Charles M. Upham, State Highway Engineer.



TWO OF THESE BURTON GASOLINE LOCOMOTIVES AND ONE PLYMOUTH GASOLINE LOCOMOTIVE HANDLED THE 24 KOPPEL AND 20 LAKEWOOD INDUSTRIAL CARS WHICH CARRIED 75 KOPPEL BATCH-BOXES ON THE HIGH POINT-WINSTON-SALEM ROAD JOB

New Lighting for Sheridan Road, Chicago

By F. L. Carl
Street Lighting Engineer

AN interesting street-lighting installation utilizing asymmetric distribution of light has recently been completed on Sheridan Road, Chicago, under direction of the Commissioners for the North Shore Park District. This district comprises Rogers Park north of Devon Avenue and is one of the fastest-growing and most exclusive residential districts in Chicago. Because of its location between the city and the prosperous North Shore towns, Sheridan Road, besides having considerable local traffic, is the main artery of travel to the north.

To adequately care for this traffic problem, Robert J. Murphy, Edward J. Welch, James P. Ward, President, and Peter J. Angsten, Commissioners of the North Shore Park District,

decided to widen the drive 10 feet, repave it and install a modern lighting system in place of the old gas lamps, which were of low candle-power. After careful consideration, it was decided to install Westinghouse lighting units mounted on Massey Hollowspun posts; 154 units were installed in an opposite arrangement with spacings of 120 feet. Each unit was equipped with the new Westinghouse-Holophane Bi-Lux refractor.

The lanterns are of the standard Westinghouse octagonal Senior type, made of bronze and equipped with panels of syenite glass. Within each lantern is mounted the Bi-Lux refractor, which consists of a truncated hollow cone of glass



SHERIDAN ROAD, CHICAGO, ILLUMINATED BY THE NEW TYPE OF REFRACTOR UNITS

in which are pressed hundreds of small prisms so arranged that they deflect the light from the side away from the curb line back onto the street, at the same time concentrating the rays so that a maximum beam is thrown up and down the street in both directions, another beam across the street, while a third beam is spread out along the sidewalk.

The system is supplied with current by the Commonwealth Edison Company, which feeds at 2,300 volts to four 24-kv.-amp., 6.6-amp. station-type regulators, located in the Park Board Office Building at Farwell Avenue and the Lake, one block east of Sheridan Road. These are controlled by four Anderson 3,300-volt time-switches, and are so arranged that half the lights are turned off at 1 A. M. From the substation the four circuits are led through No. 8, 5,000-volt, single-conductor, lead-covered cable installed in fiber ducts to large manholes at Sheridan Road, where the cable is connected, through disconnecting pot-heads, to 5,000-volt steel-taped cable, two circuits leading north, and two circuits south.

The entire Sheridan Road improvement, including the street widening and repaving, was completed in sixty days.



TYPICAL STANDARD

Recent Changes in Chicago Paving Ordinances

Inconsequential Objections Cause Heavy Expenditures

By John B. Hittell

Chief Street Engineer, Board of Local Improvements, Chicago, Ill.

IN the proposed paving of the Maryland Avenue system of streets in Chicago the following engineer's estimate was submitted to the interested property holders and considered at the public hearing:

Concrete combined curb and gutter on cinders, gravel or sand, 27,450 lineal feet at \$1.15.....	\$ 31,567.50
Filling, 20,000 cubic yards at \$2.50.....	50,000.00
Paving with standard asphalt wearing surface and binder course of 6 inches of portland cement concrete swept with natural hydraulic cement, 43,800 square yards at \$3.50.....	153,300.00
Constructing 47 new brick catch-basins complete at \$105.00	4,935.00
Adjusting abutting sidewalks	1,500.00
Adjusting abutting pavements	500.00
Adjusting sewer manholes and catch-basins, and constructing and connecting catch-basin inlets	23,912.00
Deficiency in interest on the assessment, cost of making, levying and collecting said assessment, and lawful expenses attending the making of said improvement.....	13,285.50
Total	\$279,000.00

At the hearing the resolution was amended providing for "new concrete" in lieu of the new brick catch-basins, and the ordinance as submitted to the City Council contained among others, these clauses:

"The pavements abutting on each of said above specified streets, where necessary, shall be so adjusted as to conform to the surface of the finished pavement herein described."

"The sidewalks abutting on each of said above specified streets, where necessary, shall be so adjusted as to conform to the curb elevations herein described."

"Twelve new concrete catch-basins shall be constructed and trapped and connected with the sewer in Maryland Avenue, and located in the roadway of said Maryland Avenue at necessary points, adjacent to the curb lines of said Maryland Avenue."

"Each of said catch-basins shall be connected with the sewer with tile pipe of 8 inches internal diameter and shall be trapped with an 8-inch tile pipe half-trap. The inside bottom of each of the said tile pipe half-traps shall be set 3 feet 6 inches above the said floor of each of said catch-basins."

"Each of said catch-basins shall be provided with a suitable cast-iron cover, each of which covers, inclusive of lid, shall weigh 540 pounds. Each of said cast-iron covers shall be set so that the top of the same shall coincide with the surface of the finished pavement herein described."

"The existing sewer manholes and catch-basins located in said roadway shall be so adjusted as to make the top of the cover of each of the said sewer manholes or catch-basins conform to the upper surface of the said pavement; and the existing catch-basins, necessary to this improvement,

located outside of said roadway shall be so adjusted as to make the top of the cover of each of the said catch-basins conform to the elevations herein prescribed. The existing catch-basins located on the line of the curb shall be so adjusted as to make the top of the cover of each of the said catch-basins conform to the upper surface of the said pavement, or to the said elevations according to whether the major part of said catch-basin lies within or without the said roadway. Catch-basin inlets shall be constructed at necessary points in said gutters. The catch-basins which are not located in the gutters shall be connected with said inlets by means of tile pipe of 8 inches inside diameter."

The estimated cost of the improvement, being in excess of \$100,000.00, was referred by the Council to the Committee on Streets and Alleys, which held several hearings at which the arguments for masonry construction and concrete construction in catch-basins were presented by the different interests. The Committee reported the ordinance favorably, and it was adopted and passed by the Council.

Objections Taken to Court

The case was called for trial October 3, 1923, before Judge Hoover. The confirmation was opposed by several attorneys representing 15 per cent of the property owners. The ordinance was attacked on the following grounds:

1. The ordinance provided for adjusting existing sewer manholes and catch-basins, and constructing catch-basin inlets, the cost of which was estimated in a lump sum. The attorneys opposing confirmation attacked this provision, first, because the costs were not itemized, and, second, because the type of inlet was not specified where the existing catch-basins were not in the roadway adjacent to the curb and could not be used directly as inlets. Therefore, a type of inlet known as a grate or gutter box was to be used and connected to the catch-basin. Opposing attorneys then called the attention of the Court to the fact that the grate type of inlet was not directly provided for in the ordinance, and material for its construction was not specified, and provision for its connection to existing sewers, if there were any, was not shown.

2. These attorneys also contended that the elevation of the 8-inch tile pipe connection from new catch-basins should be shown at a point of connection with the sewer in streets and the location of new catch-basins shown; and further, that the ordinance should show a connection down-

ward to the sewer; the elevation of catch-basins being known, the elevation of the sewer should also be known. The attorney for the city contended that exact locations could not be shown, because a period of one year to two years might elapse between the time the estimate was made by the engineer and the time the street would be paved. Also, some obstruction, such as a public utility conduit or water pipe, might interfere with the location of a catch-basin as definitely fixed in the ordinance.

I will cite some excerpts from Judge Hoover's decision in which he dismissed the petition:

"There were a number of objections, of course, filed in this proceeding, but the objections argued and relied upon were those aimed at the validity of the ordinance itself for the purpose of defeating, if possible, the entire improvement as provided for in the ordinance.

"Taking up the objections, in a general way, in the order in which they were argued, there was, first, the objection to the proceedings of the Board of Local Improvements at the public hearing. The evidence shows that the original resolution of the Board of Local Improvements providing for this improvement, together with the engineer's estimate, was, so far as specifications were concerned, a duplicate of the provisions of the ordinance, except that at the public hearing a motion was made, which, in substance, was to change the material used in the construction of the new catch-basins, or in the construction of catch-basins, from brick to concrete. There was no provision made in the motion as to what the specifications should be as to size, shape or dimensions of the new catch-basins, and it was urged that inasmuch as the motion was merely to change the material to be used in the construction, no dimensions of the catch-basins as proposed were given, and that the property owners at the public hearing had no means of knowing what was proposed to be done as to size and location, and so forth, of the proposed new catch-basins.

"I think it may be safely assumed, in view of the fact that the original resolution provided specifically as to what the size and shape and dimensions of the catch-basins which were to have been made of brick should be, and that the resolution or motion made at the public hearing made no reference to any change of size or dimensions except a change of material to be used in the construction, that the property owner had a right to go away from the public hearing assuming that the only change made at the public hearing was that instead of being constructed of brick they were to be constructed of concrete. That was the only amendment to the original resolution that was made at the public hearing.

"Now, it is contended, sections 7 and 8 provided that there must be a new resolution or an amendment which is before the property owners at the public hearing, but I think in view of all the authorities on that question that the motion which was carried by the Board is, in itself, sufficient, but the difficulty with it is that after amendment was made in pursuance of the resolution, the engineer who made the amendment in compliance with the resolution changed somewhat the dimensions of the catch-basins as provided for in the

original resolution. The original resolution provided for a wall in catch-basins 8 inches thick. The amendment made to that resolution provided for a wall in catch-basins 5 inches thick and a depth of 7 feet instead of 7 feet and 2 inches. It is contended that these changes constituted a variance which was fatal to the ordinance. If this were the only question involved, this Court would be inclined to hold that variance was not a material variance, at least not of sufficient importance on that one proposition to invalidate this ordinance. But that is not the only objection urged. I might suggest that it seems to me that to strictly comply with sections 7 and 8, there should be, if there are any changes in the original resolution—I believe the spirit of the statute is that the property owner at the public hearing must know and has a right to know at that public hearing just what those changes are going to be. If it is a change in material, if it is a change in dimensions, if it is a change in location, or any other changes, the motion or resolution should specify what they should be.

"I refer now to the opinion of the Supreme Court in the case of *Bloomington vs. Davis*. There are some similarities and some differences between the ordinance in the *Bloomington* case and the ordinance in this case. Reading from the *Bloomington* case:

One objection is that the ordinance provided for five cast-iron sewer inlets, which shall be constructed flush with the face of the curb and gutter; said inlets shall be connected with the public sewer by the means of 12-inch vitrified clay sewer pipe. [This] does not sufficiently describe the location of that portion of the improvement. The ordinance also provided that the inlets shall be connected with the sewer at the manholes therein, and that the sewer pipe connecting these inlets with the public sewer shall be laid on a uniform grade with not less than $\frac{1}{4}$ -inch fall for each foot in length from the point of beginning to the connection with the sewer.

"The ordinance before us in the *Maryland Avenue* case has a general provision that the connection shall be made with the sewer of each of the streets respectively, and you might infer from the reading of the ordinance, although there is no allegation particularly to that effect, but such an inference could be drawn from the general language, that there are sewers in certain of these streets, but the ordinance and the resolution in this case, as well as in the *Bloomington* case, do not give the location of the sewers. It is impossible to determine from any of the proceedings in this case where the sewers are located, except from a plat which was introduced in evidence during the hearing of the case. It is contended by the objectors here that it is incumbent upon the city in preparing this ordinance—upon the engineering department—to state what the length of these drains shall be and what the grade shall be at which they are to be laid, and the location of the catch-basins. In this case there is nothing said relative to grades, nothing to indicate the location of the sewer, whether it is in one part of the street or another, and nothing to indicate the location of the manholes, except left to the discretion of the engineer. In that respect it is parallel with the *Bloomington* case, except that the ordinance in the *Davis* case does provide what the fall of the pipe shall be from the catch-basin to the sewer— $\frac{1}{4}$ of an inch for each foot. This does not make any provision as to whether the pipe shall run up-hill or down.

"It is contended on the part of the city that some of these objections are somewhat hypercritical, and that certain things must be left to the discretion of the engineer, and to what the Supreme Court has been pleased to term the 'exigencies of construction,' and that in the actual improvement they run across conditions when excavations are made which cannot be foreseen, and that, therefore, to describe the exact location of these sewers, the exact grades, the exact location of these catch-basins, would be, if not an impossibility, an impracticability. It is urged, however, on the part of the objectors that that theory is disproved by the facts in this case, because during the hearing of this case a plat was prepared which set forth the grades and all of the matters for which substantially an objection had been raised. In other words, the question of the location of the sewers, the question of grades and all these questions, are things that are peculiarly within the knowledge of the petitioner. The fact that they prepared that during the hearing, it is insisted, should be deemed by the Court as some evidence that these grades could be established and all these matters ascertained prior to the inception of the proceeding with just as much accuracy and just as much detail as they can during the hearing.

"Trying to take as broad a view as the Court can of the situation, in view of the tendency of the decisions of the Supreme Court within late years toward requiring full specifications as to the kind, character and location and so forth of the improvements, it does seem to me that this knowledge being within the knowledge of the city (they have their map department and their records as to where all these improvements are) can substantially comply with the ruling of the Supreme Court on these matters. Let us assume that you did in your ordinance provide with certainty that certain things in an improvement, as, for instance, a catch-basin or other component part of the improvement, shall be located at a certain place, and when you begin excavating there you find, by reason of underground work or other obstacles, you cannot locate it at that particular place, it must be changed somewhat, and in that respect varies from the provisions in the ordinance as to the location or the shape or the style provided in the ordinance, it seems to me that the Local Improvement Act provides for that, because, if your ordinance provides that a thing shall be of a certain size or shape or should be located at a certain specific spot, and you find it is impossible as a matter of construction to place it there as provided in the ordinance, under section 84, when you apply to the Court for a certificate of completion, the law providing that upon a showing that the work has been done in substantial compliance with the statute, allows the room for this discretion in the method of construction which it is contended on the part of the city the engineer of the Board of Local Improvements should have. Because, if you show in your application for final certificate, and somebody objects that a manhole or catch-basin is not placed where the ordinance provides, and you show in making that improvement you ran upon water pipes or some other obstacles that prevented your putting it there, can you imagine any court in the world that would refuse to give a certificate of final completion as a substantial compliance

when it is shown to the court that as an engineering proposition it is impracticable to place it the same as the ordinance provided? So, it does not seem to me, after going into these authorities thoroughly, that it is the intent of the Supreme Court or the Legislature that these matters of discretion should be left with the Board of Local Improvements or with the Engineering Department in the ordinance, but that it is a matter of discretion that might arise where by force of circumstances or necessity there was necessarily some discretion used, where they made some slight variance from the provisions of the ordinance.

"Now, speaking about this question of discretion and the impossibility of doing certain things on the part of the city, the Supreme Court has already passed upon that subject in 183 Illinois, only in a general way, yet, it indicates what the law of this state is, and the language of the Supreme Court is this in that case:

For this reason it is said that the improvement cannot be described but its character must depend upon the exigencies of construction. The obvious answer to this is that if the city is not able to specify the nature, character, locality and description of the improvement, it is not authorized to make it by special assessment at the expense of the property owners. The Legislature has fixed the conditions upon which the special assessment may be levied.

"I might go ahead and say a good many things about these inlets, about the provisions for connecting the drains to the catch-basins, about the question of whether or not these drains from the catch-basins to the sewers are provided for and how they are provided for, but this ordinance does not say—it says the drains shall lead from the catch-basins to the sewer, but does not say whether you shall take a man and knock a hole in the pipe or connect them with Y's. All those things, in my judgment, should be provided for. I think there is no need of saying anything upon the question of the reasonableness of this improvement. I think it is reasonable and I think it is an improvement that is badly needed, but that will not cure the ordinance."

Attempt to Overcome Court's Objections

In consequence of this drastic opinion, a conference was held between the attorneys and engineers of the Board, at which the former contended it would be useless to go into Court unless the estimate and ordinances were considerably more in detail than they had been in the past, especially with reference to the items of sewer adjustment work, sidewalk construction and adjusting of abutting pavements.

Realizing that it is almost an impossibility to visualize in advance just the necessary amount of work to be done at street and sidewalk intersections, it was determined that all reference to these operations should be omitted; and any cure, if necessary, should come from a collateral ordinance requiring the Commissioner of Public Works to adjust the walks and pavements at intersections, and pay the same from the general maintenance fund of the city.

ENGINEER'S ESTIMATE OF COST OF IMPROVEMENT

Asphalt pavement with foundation	4,520 square yards	@ \$ 4.00.....	\$18,080.00
Concrete curb and gutter with foundation and backfilling.....	2,730 lineal feet	@ 1.25.....	3,412.50
Cutting	3,085 cubic yards	@ 2.50.....	7,712.50
New concrete catch-basins complete	4	@ 105.00.....	420.00
Catch-basin inlets complete	.14	@ 40.00.....	560.00
8-inch tile pipe catch-basin connections.....	220 lineal feet	@ 3.00.....	660.00
Sewer manholes adjusted	9	@ 9.00.....	81.00
Sewer catch-basins adjusted	.14	@ 40.00.....	560.00
New iron covers	.14	@ 30.00.....	420.00
Deficiency in interest on assessment, cost of making, levying and collecting said assessment, and the lawful expenses attending the making of said improvement			1,594.00
Total			\$33,500.00

To meet with the other objections, a copy of an estimate and extracts from one of the recent ordinances will show how this is attempted to be done.

"Four new concrete catch-basins shall be built, trapped and connected with the sewer in the center of said North Neva Avenue and located in the roadway of said North Neva Avenue adjacent to the curb lines at points as follows: two 60 feet south of West Grand Avenue and two 60 feet north of Palmer Street.

"Each of the catch-basins herein provided shall be cylindrical in shape and shall have an internal diameter of 4-feet, excepting the upper portion 2 feet and 6 inches in height, which shall be conical in shape, being reduced to 2 feet internal diameter at the top. The wall of each of said catch-basins shall be 5 inches in thickness and shall rest upon a floor of pine plank 2 inches in thickness, which shall be covered with a layer of concrete 3 inches in thickness. Each of said catch-basins shall be 7 feet and 6 inches in depth, measuring from the top of the concrete wall to the top of the concrete floor.

"Each of said catch-basins shall be trapped with an 8-inch tile pipe half-trap. The inside bottom of said half-traps shall be set 3 feet above the said floor of each of said catch-basins. Each of said half-traps shall be connected in a direct line, which shall slope downward, to the sewer herein specified by means of tile pipe of 8 inches internal diameter.

"The elevation of the center of the said 8-inch pipes where they connect with the sewer at said point 60 feet south of West Grand Avenue shall be 59 feet above said Chicago City datum, and at said point 60 feet north of Palmer Street shall be 64.20 feet above said Chicago city datum.

"The existing catch-basins located in the sidewalk space adjacent to the curb lines of said North Neva Avenue shall be so adjusted as to make the top of the covers herein provided for said catch-basins conform to the top of the adjacent curb. Each of said catch-basins shall be provided with a suitable cast-iron cover, each of which covers, inclusive of lid, shall weigh 315 pounds.

"A catch-basin inlet shall be constructed in the gutter adjacent to each of the existing catch-basins. Each of said inlets shall consist of a suitable cast-iron grating 21½ inches by 14½ inches, weighing 90 pounds, supported in a suitable cast-iron frame weighing 190 pounds, set upon a concrete foundation composed of 1 part of portland cement, 3 parts of clean torpedo sand, and 5 parts of crushed stone or gravel.

"The concrete foundation for said inlets shall be 36 inches in depth, 25 inches in width, and 38 inches in length, with a suitable opening through the foundation connecting the grating with the 8-inch tile pipe hereinafter provided leading to the adjacent catch-basin.

"Each of said inlets shall be connected with the adjacent catch-basin by means of tile pipe of 8 inches internal diameter. The center of the 8-inch tile pipe at its connection with the opening in the foundation shall be 33 inches below the top of said grating, and at the connection with the catch-basin shall be 45 inches below the top of the cover of the said catch-basin.

"The top of said cast iron gratings shall conform to the upper surface of the gutter immediately adjacent."

It would seem, at least to one whose education is not along legal lines, that the courts have laid stress on the need of furnishing detailed information to the property holders—information which a great majority of them are incapable of appreciating; or, if understood, the value of it is very questionable. Yet it must be taken into consideration that a law that places the power practically in the hands of six men in the city of Chicago to levy additional taxation of 10 to 12 million dollars a year upon the property holders should be such as to safeguard every right of the latter.

I am of the opinion that the present laws must soon be rewritten in order to obviate the effect of inconsequential objections to specifications.

Oil-Burning Equipment in Wilmington Water-Works

IN the last month of the fiscal year 1921-22, the water department of Wilmington, Del., installed an oil-burning equipment under two boilers in combination with an oil pump in duplicate and a reservoir tank of 15,000 gallons.

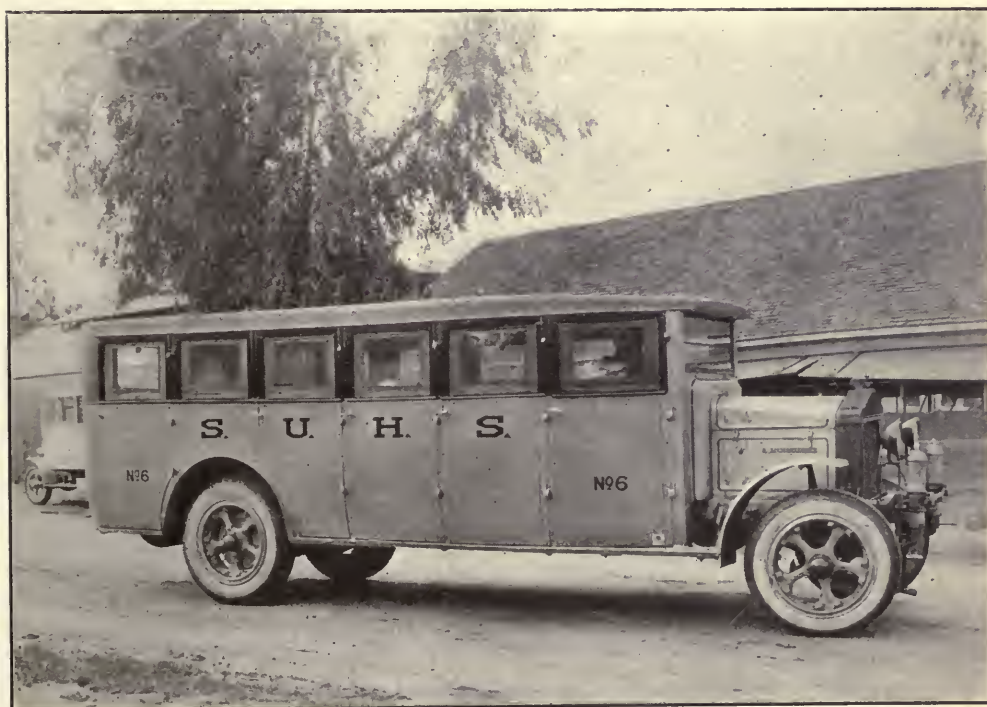
The fuel cost, with oil at 4 cents per gallon and coal at an average price of \$6.91 per ton of 2,000 pounds, is in favor of coal. This is based on the amount of work done or the amount of

water pumped by coal compared with the water pumped by oil. Thus, the average for the year was 1,000,000 gallons of water pumped for \$6.61 of coal, whereas 1,000,000 gallons was pumped with \$7.58 of oil. In June, 1923, the price of oil went to 4.9 cents per gallon, but in July it dropped to 4½ cents, and it is still too high to displace the use of coal entirely and can only be considered as a temporary substitute.

Protection and Transportation for Cities Through Motor Vehicles



TESTING AN AMERICAN-LAFRANCE TYPE 12, 1,000-GALLON-CAPACITY TRIPLE-COMBINATION AT ANCHORAGE, ALASKA



GARFORD BUS USED BY THE SANGER UNION HIGH SCHOOL, SANGER, CALIF.
We are indebted to S. McCartaney, Chamber of Commerce, Sanger, Calif., for this photograph

The Use of Iodine in Public Water-Supplies

When Goiter Is Endemic, Is It More Economical to Treat the Whole Water-Supply or the Individual Consumer?

By J. W. Ellms

Engineer of Water Purification and Sewage Disposal, Water Department, Cleveland, Ohio

THE treatment of public water-supplies with salts of iodine as a preventive of simple goiter has been recently suggested, and in at least one instance has been tried in the water-supply of a large city. The prevalence of simple goiter in certain districts has long been recognized, but the cause for its continued presence in these localities has been established only within the last twenty-five or thirty years. Iodine appears to be necessary for the normal functioning of the thyroid glands. A minimum percentage of about 0.1 per cent seems to be required for the maintenance of normal or colloid gland structure. The iodine is present as tri-iodo-indol-propionic acid. The substitution of either of the other halogens, chlorine or bromine, for the iodine in this acid produces a stable compound, but one that is devoid of physiological activity.*

Goiter is a disease which affects not only human beings, but animals as well. Fresh-water fish develop this condition at times, and the first practical application of iodine in the prevention of goiter on a large scale was its use in fish hatcheries in Pennsylvania in 1909. The prevalence of goiter among adolescent girls and among women during pregnancy is well known, especially in those areas now recognized as endemic goiter districts.

Since the cause for this disease is a lack of natural iodine intake, it is of interest to learn why there should be a deficiency of iodine in some localities, and, in consequence, it should be present only in extremely small amounts, or not at all, in the food and water of these regions. Dr. Emery R. Hayhurst† has shown that of the four halogens, iodine is by far the rarest in natural distribution; but that it may always be found in sea water, where it is present in an amount equivalent to 0.01

gram of sodium iodide (NaI) per liter. It is also present in considerable amounts in sea plants such as the giant sea-kelp. The commercial sources of iodine are from Chili salt-peter and from sea-kelp.

Iodine is usually found as sodium iodide, a salt which is very soluble in water, being more than five times as soluble as common salt. This high solubility probably accounts for its practical disappearance from inland salt brines, or salt deposits, and for its occurrence in sea water. Constant leaching out of salt deposits, and the carriage of this highly soluble salt to lower levels, and finally into the sea, have largely exhausted this compound from our soil and natural waters.

Since the natural inland brines and salt deposits do not furnish us any iodine, and since, even by the method of manufacturing salt from sea water, the soluble iodine salts are lost in the evaporation process, Dr. Hayhurst concludes that "land animals, including man, have no dependable source of iodine in the salt derived from inland sources, which produce about 96 per cent of our total salt supply," and that "irrespective of whether it is derived from inland sources or from sea water, salt is not at present a source of iodine."

It is therefore apparent that if iodine deficiency in our diet is not now cared for naturally, it must be supplied artificially; and that in doing so we shall be able to prevent simple goiter, now prevalent in so many parts of the world. Whether this deficiency shall be supplied wholesale through our water-supplies, through salt as a condiment, or through direct treatment of individuals, is a matter both of efficacy and cost.

So far as the writer can learn, iodine or its salts are now made only commercially to meet the demands of the pharmaceutical and chemical trade. As prepared, sodium iodide will contain from 5 to 6 per cent of water, and the average purity of the salt will run over 99 per cent sodium iodide (NaI). The price in lots of 25 pounds and over is about

* Dr. O. P. Kimball, *Journal American Public Health Association*, page 81, February, 1923.

† Dr. Emery R. Hayhurst, *Bulletin Ohio State Department of Health*, on "The Present-Day Sources of Common Salt in Relation to Health, and Especially to Iodine Scarcity and Goiter."

\$4.25 a pound at point of shipment. This is the compound that would have to be used in our public water-supplies, if their iodine content is to be increased.

Treatment of Rochester Water-Supply

To the courtesy of Beekman C. Little, Superintendent of the Water Department of Rochester, N. Y., the writer is indebted for the following information concerning the results of the latest treatment of that city's water-supply. This is in addition to the information supplied in Mr. Little's paper which appeared in the July, 1923 issue of the *Journal of the American Water Works Association*. During the present year, between September 11 and October 2, there were supplied to the Rochester water-supply 16.6 pounds of sodium iodide daily, or an amount which is equal to 0.664-pound per million gallons. Assuming that this represents a salt containing 94 per cent of NaI, it is equivalent to applying about 75 parts of sodium iodide per billion parts of water.

The method of applying the sodium iodide consisted in placing the salt (16.6-lbs.) in a bag, and suspending it in the water back of a dam and just before the water entered a reservoir. The salt was dissolved in a few minutes, and consequently the entire dose for the day passed into the reservoir in these few minutes, and was diffused through the water on its way to the distribution mains in the city about ten miles distant.

It was found that the quantity of sodium iodide reaching the taps in the city rose gradually from 4 or 5 parts per billion to 50 parts per billion between September 11 and October 2, when treatment was discontinued. From October 2 until October 19 it gradually fell off, reaching its original iodine content on the latter date. An amount equal to 50 parts per billion was maintained for only four days, and an inspection of the curve would indicate that the average amount was not much more than 30 parts per billion.

It is thus apparent that the dosage was not much more than 67 per cent efficient at the maximum, and probably not more than 40 per cent efficient on an average. The normal content of sodium iodide in the Rochester water, according to their determinations, ranged from 1 to 4 or 5 parts per billion. The

quantity of water used daily in Rochester is approximately 25 million gallons.

To provide a treatment of 75 parts of sodium iodide per billion in the Cleveland water-supply, where on an average about 150 million gallons are used daily, it would require the application of practically 100 pounds of NaI each day. If this treatment were to be carried on for 30 days each year, the amount required would be 3,000 pounds, which at a price of \$4.25 per pound, exclusive of freight, would amount to a cost of \$12,750 per year; or a cost for the chemical alone of \$2.83 per million gallons of water treated.

Professor George C. Whipple states that about 1.5 quarts of liquid are consumed per day by the average person, of which one-half may be assumed to be water and the rest tea, coffee, etc. As water is, of course, used in the preparation of practically all foods, we may assume that the iodine content of approximately one gallon of water per day might be consumed per person. Assuming that one million people would use one gallon each for drinking and preparation of food, then one million gallons of water, or 0.67 per cent of the average amount supplied per day to consumers in Cleveland, would be actually needed for iodine treatment.

If 75 parts per billion of sodium iodide were actually present in the water-supply, it would be equivalent to approximately 0.0044 grain per gallon, which each person would receive in the one gallon of water presumably utilized. If less than 1 per cent of the total quantity of sodium iodide applied to the water-supply is really utilized, it would seem to be a decidedly wasteful method for producing the results desired.

The chlorine applied to practically all water-supplies at the present time would have a tendency to decompose the sodium iodide introduced into a water and to liberate iodine. While this element would not be lost, its combination with organic matter or its reaction with other mineral constituents might adversely affect its therapeutic value. It therefore appears to the writer that it would be far more effective and much less expensive to treat the individual directly for simple goiter, than to attempt the medication of an entire water-supply.

ACKNOWLEDGMENT.—From a paper read before the Ohio Conference on Water Purification, at Columbus, Ohio.

Some people are afraid of the effect of the chemicals used in water purification. Such apprehension is groundless. The chemicals that are used to cause settling go to the bottom and practically never get into the water again. The amount of chlorine added, while sufficient to kill germs, is only about one part in a million parts of water—so little that it cannot possibly harm anyone.

—Dr. Matthias Nicoll, Jr., Commissioner, New York State Department of Health.



The Community Bathing-Beach in Aurora, Illinois

By Joseph C. Winslow

ONE of the largest outdoor swimming pools in the country was erected in 1923 at the Central States Fair Grounds on the Lincoln Highway between Aurora and Geneva, Ill. The pool itself is not owned by the fair association. It was financed by the Community Swimming Pool, Inc., with a capital stock of \$75,000, shares being sold to the general public at \$25. The fair association receives revenue from the income of the pool.

The concrete pool, measuring 320 x 160 feet, was built by the Ornamental Concrete Company, of Aurora. Surrounding the pool there is 1,200 square feet of sand beach, making the measurement of the entire beach 537 feet by 376 feet. The sand is 18 inches deep. The water capacity of the pool is 1,250,000 gallons.

At the south end of the pool are bath-houses with locker accommodations for 2,000 people. Towels and bathing-suits, freshly laundered each time they are used, are supplied to the bathers.

Water for the pool is supplied by an artesian well on the grounds. Before entering the pool the water is passed through the recirculating and refiltering system, manufactured by Graver Corporation, East Chicago, Ind., where it is filtered and sterilized to remove suspended matter and bacteria. This system consists of two vertical pressure filters, each 10 feet in diameter by 9 feet 4 inches high, using a filtering medium consisting of two layers of crushed quartz above two layers of graduated-sized gravel. The filters have a

capacity of 28,260 gallons per hour, based on a rate of 3 gallons per square foot of filtering surface per minute; one alum pot for introducing alum into the water; one Wallace and Tiernan chlorinator, and one 6-inch centrifugal American Well Works pump having a capacity of 28,500 gallons per hour.

Recirculating Equipment

The water is pumped from the artesian well by means of a 10-inch deep-well American Well Works pump into an elevated storage tank. The water then flows by gravity through an 8- x 4-inch Venturi tube and then filters into the pool. When the pool is full, water from the tower is shut off, and circulation is commenced by placing the 6-inch centrifugal pump in operation.

Water is withdrawn from the deep end of the pool, forced through the Venturi tube and filters, then returned into the shallow end. Before the water passes into the filters it is mixed with alum, which is introduced at the Venturi tube, the proper mixture being controlled by means of a needle valve located on the ½-inch supply line to the alum pot. Alum is introduced to increase the efficiency of the filters by forming on the top of the filter bed a gelatinous mat which removes minute particles that might otherwise remain in the water.

After passing the filters and before entering the pool, the water is treated with chlorine. Bacteriological tests show an exceptionally sanitary condition of the water at all times.

The cost of operating a pool by this recirculating and refiltering method shows a definite saving over that of the older draw-and-fill method, by which the entire contents of the pool are withdrawn at stated intervals. Another point in favor of the recirculating system is the fact that pollution is always kept at a minimum, while with the draw-and-fill method it is cumulative and often becomes excessive.

Other pools operated like the Aurora pool

and with like results include the Cascade pools at Birmingham, Ala., and Nashville, Tenn.; the pool at Dreamland Park, Newark, N. J.; the municipal swimming pool, Memphis, Tenn., and the one at the Tri-State Fair Grounds, Danville, Ill.

EDITORIAL NOTE.—For a view of the recirculating and refiltering system of the community swimming pool in Aurora, Ill., see article on "The Design of Swimming Pools as to Operation and Sanitation," by Jack J. Hinman, Jr., page 357, in the April, 1924, issue of THE AMERICAN CITY, with a brief description of this method of removing suspended matter and bacteria.

Municipal Reservoir Converted into Swimming Pool

By S. B. Taylor

Commissioner of Parks and Public Properties, Altoona, Pa.

WHEN a municipal reservoir is no longer required by the city, or when it is condemned for any other reason, it can still be put to excellent use, as was demonstrated in Altoona last summer. For years the people of Altoona had felt a growing need of a municipal swimming pool affording clear, sanitary water and protection to the life and health of bathers. Last summer such a natorium was provided when the old municipal reservoir was converted into a modern concrete swimming pool. Previous to that time the only places available for swimming had

no supervision to prevent accidents and the sanitary condition of the water was usually of questionable character.

The actual construction of the pool was undertaken by the city. The cost was \$14,000, including the bath-house. The pool is under the supervision of the Park Commission, and a constant flow of water from the city mains insures a clear, pure pool at all times. A further safeguard on sanitary conditions is provided by laboratory tests made at frequent periods. The pool is 120 feet square, with depths ranging from 18 inches



MUNICIPAL SWIMMING POOL, ALTOONA, PA., FORMERLY A CITY RESERVOIR

to 7½ feet. A beach of clean white sand is provided at the shallow end. The accompanying photograph shows the sand beach and the sloping walls of the old reservoir.

The bath-house provides sixty dressing-rooms in the wing for men and thirty dressing-rooms on the women's side. Between the two wings are located the ticket office, check room and lunch room. Bathers are required to provide their own suits. Eight employees, including a manager, five life-guards, and attendants for the women's and men's dressing-rooms, insure proper supervision and protection against accidents.

A charge of 10 cents is made for the use of the pool, dressing-rooms and check room by children; 20 cents for adults, and 10 cents for spectators. From 9 to 12 A. M., the pool is reserved for playground children, but during the remainder of the day there are no age restrictions. The lunch-room concession is leased.

The popularity of the pool and its financial

success are shown by the attendance record since July 7, 1923, when the pool was opened, which shows that an average of 800 people per day used the pool during the rest of the 1923 season, with a record of 2,800 for a single day. The report on the pool for the season indicates that the revenue obtained, even from the nominal charges imposed, will not only pay the costs of operation and maintenance, but will soon return the entire cost of the plant. The returns from this pool agree with reports received from pools owned and operated strictly for profit, which show that the net annual returns from such pools amount to from 25 per cent to 80 per cent of the capital invested.

In view of the popularity and financial success of this pool, the Park Commissioners are now planning to build a complete system of self-supporting concrete swimming pools for the city of Altoona, so that hereafter the people of the city will not lack places for swimming in summer and skating in winter.

Pasadena's Municipal Plunges



THESE TWO PLUNGES IN BROOKSIDE PARK COST, RESPECTIVELY, ABOUT \$28,500 AND \$31,200. THE ATTENDANCE FOR MAY 19-SEPTEMBER 30, 1923, WAS 83,905

Interest Rates on Bank Balances

FORTY-NINE city auditors, thirty-four city clerks, eighteen city controllers and twenty-five other municipal officials have responded to THE AMERICAN CITY'S request for information as to the interest rates which local banks are paying on city deposits. Twelve others, not included in the list, report that no interest is being received.

The accompanying table gives the rate of interest received on daily balances or, in some cases, on the lowest monthly balance. If a different interest rate is reported on long-term balances, that figure is given in the second column.

The following are excerpts from letters from some of the cities which have been receiving 4 per cent or more on their daily balances:

ASHTABULA, OHIO

Through competitive bids the city of Ashtabula secured a rate of 5.02 per cent on a daily balance of \$100,000, and 4.17 per cent on smaller balances, for a period of three years. A shorter contract period would probably have meant a lower rate of interest, by reason of the possibility

of a shift of funds to another bank.

The average balance for the last fifteen months has been about \$317,000, the high mark being \$457,000 and the lowest \$191,000. The city has just completed an enlargement of the municipal electric plant costing approximately \$750,000, has invested \$250,000 in a municipal street railway since August 1, 1922, and is entering upon the second year's program of construction of a system of storm drains, sanitary sewers and sewage disposal plant, which, when the entire program is completed, will involve the expenditure of \$700,000 to \$800,000. These, together with street and other improvements, constitute a fairly large program for a city of this size (22,000 to 25,000).

Our charter provides that no contract involving the expenditure of money shall be entered into unless the city auditor shall first certify that the money required for such contract is in the treasury, to the credit of the fund from which it is to be drawn. Hence it will be seen that each improvement enterprise must be separately financed, and as the improvements mentioned overlap each other in point of time of construction, the daily balance on deposit is materially increased. As might be inferred, it is sometimes necessary, in the construction of these improvements, to withdraw from the depository bank amounts large in comparison with the total deposit. It has been

Municipality	Interest Rate (per cent)		Municipality	Interest Rate (per cent)		Municipality	Interest Rate (per cent)	
	Regu- lar	Long- Term		Regu- lar	Long- Term		Regu- lar	Long- Term
Alcoa, Tenn.	3	4	Grand Rapids, Mich. . .	3	3.95	Orange, N. J.	2	..
Alice, Tex.	4½	..	Greensboro, N. C.	3	4	Orlando, Fla.	2	4
Ann Arbor, Mich.	2½	..	Hardin, Mont.	2	..	Park Falls, Wis.	..	5
Antigo, Wis.	2	..	Highland Park, Mich. . .	2½	3	Pasco, Wash.	2	..
Ashtabula, O.	4.17	to 5.02	Higmore, S. Dak.	3	..	Phillips, Wis.	2	..
Austin, Tex.	2½	..	Hillsboro, N. Dak.	..	5	Pierre, S. Dak.	3	4
Barberton, O.	4¾	..	Horicon, Wis.	3	..	Portland, Ore.	2	3½
Batavia, N. Y.	4	..	Huntington, W. Va.	3	..	Portsmouth, N. H.	4.6	..
Bay City, Mich.	3	4	Internat'l Falls, Minn. .	2	4	Portsmouth, O.	2½	..
Bloomer, Wis.	4*	..	Jackson, Mich.	3	4	Pottsville, Pa.	3	4
Breckenridge, Minn. . .	2	5	Jackson, Minn.	..	5	Putnam, Conn.	..	4
Brookline, Mass.	2½	4	Joplin, Mo.	3.03	..	Quana, Tex.	2½	4
Buffalo, N. Y.	2½	4	Kenosha, Wis.	2	3*	Rapid City, S. Dak. . .	4	..
Burkburnett, Tex.	5½	..	Laconia, N. H.	..	3	Ravenna, O.	3	..
Cadillac, Mich.	5.02	..	LaCrosse, Wis.	2½	3	Reading, Pa.	2	3
Canton, O.	3½	4¼	Lancaster, O.	2	..	Rice Lake, Wis.	4	..
Charleston, Wash.	2	..	Lebanon, Pa.	..	3	Roanoke, Va.	2½	3
Chico, Calif.	2	3	Lidgerwood, N. Dak. . .	3	5	St. Bernard, O.	4.25	..
Chilton, Wis.	3	..	Lima, O.	4.32	..	St. Marys, O.	2	..
Cincinnati, O.	4.57	to 4.63	Lisbon, N. Dak.	2	4	St. Paul, Minn.	2	3
Cohoes, N. Y.	2	4*	Little Falls, Minn.	1	2	Salem, Ore.	2	..
Conneaut, O.	3	..	Lynn, Mass.	3	..	San Antonio, Tex.	3	..
Connellsville, Pa.	3.125	..	McKinney, Tex.	2.51	..	Sault Ste. Marie, Mich. .	3	..
Crookston, Minn.	3	5	Malden, Mass.	2½	3½	Sedalia, Mo.	2½	..
Cudahy, Wis.	2	2	Malvern, Pa.	..	3	Sharon, Pa.	3	4
Dallas, Tex.	4.10	..	Marks, Miss.	2	..	Spokane, Wash.	2	..
Dell Rapids, S. Dak. . .	..	5	Menomonie, Wis.	3½	..	Springfield, Mo.	3½	..
De Pere, Wis.	2	..	Miami, Fla.	2	4	Superior, Wis.	1½	3
Detroit, Minn.	2	4	Minneapolis, Minn.	2	3	Tacoma, Wash.	2	..
Eau Claire, Wis.	2½	3	Minot, N. Dak.	2	4†	Tahlequah, Okla.	3	4
Erie, Pa.	3.75	..	Monett, Mo.	3½	4	Temple, Tex.	3	..
Eureka, Mont.	2½	..	Muskegon, Mich.	2¾	..	Tewksbury, Mass.	2	..
Fergus Falls, Minn. . .	2	5	Muskogee, Okla.	3	3½	The Dalles, Ore.	2	6*
Flandreau, S. Dak.	5	..	Napa, Calif.	2½	..	Wahpeton, N. Dak.	2	..
Flint, Mich.	2	4*	Nebraska City, Nebr. .	2	..	Wakefield, Mich.	..	3
Fort Pierce, Fla.	2	4	New Britain, Conn.	2½	..	Waltham, Mass.	2½	4
Franklin, N. J.	..	4	New Brunswick, N. J. .	2	3	Watsonville, Calif.	2	4
Franklin, Pa.	4	..	Newport News, Va.	..	4	Wellsville, O.	2	2½*
Glasgow, Mont.	2½	..	New Rochelle, N. Y. . .	2	..	Winchester, Va.	3	..
Goldsboro, N. C.	3	..	Oakes, N. Dak.	2	4	Winfield, Kans.	2	..
Grand Forks, N. Dak. .	2	4*	Olean, N. Y.	2	..	Yankton, S. Dak.	2	..
			Onalaska, Wis.	2	..	Zanesville, O.	2.55	..

*On certificates of deposit, or sinking funds, or loans. †Rate is for balances left for 6 months. Higher rate received if left for one year.

the policy of the city, however, to keep the bank informed as closely as possible as to the time and probable amount of such withdrawal. This reciprocity may have had something to do with the rate of interest offered.

M. A. TAYLOR,
City Auditor.

March 7, 1924

BARBERTON, OHIO

When the contract for our city funds was advertised two years ago, two bids were received, giving us 4.75 per cent interest on all city funds on daily balances. These balances showed a daily average of \$311,450.98 for the year 1923. Last month we advertised the contract for the next two years, and received four bids, resulting in 3½ per cent on inactive funds and 3¼ per cent on active funds. We placed \$150,000 each in two banks at 3½ per cent, and the rest of our funds will draw but 3¼ per cent for the next two years.

H. B. FRASE,
Auditor.

March 7, 1924

ST. BERNARD, OHIO

We comply with Section 4295* of the General Code of the state of Ohio, which calls for competitive bidding. Our good fortune in securing so high an interest rate is due, I believe, to the fact that we are close to the city of Cincinnati, and the one bank in the city of St. Bernard submits a high bid, both for reasons of civic pride and for the sake of its own financial statement.

FRANK J. SCHWAB,
Auditor.

March 10, 1924

* Under the terms of this act, any political subdivision of the state of Ohio may provide by ordinance for the deposit of all public moneys coming into the hands of the treasurer in such bank or banks, situated within the municipality or county, as offer, at competitive bidding, the highest rate of interest; the safety of such deposits to be protected by the bank by sufficient bond or surety or by a deposit of interest-bearing obligations of the United States or other public securities, under conditions specified in the act.

FRANKLIN, PA.

The city of Franklin has been, for several years, receiving 4 per cent interest, each month, on daily bank balances in city and water department funds. In the last two years these receipts from interest have totaled \$4,080.

Prior to 1910 the city has received no interest except on sinking fund moneys placed in savings accounts, on which interest was credited each six months at 4 per cent.

In 1910, as a result of taking bids, the city received 3½ per cent on all funds, interest being paid each month. Later this was increased to 3¾ per cent, and again in 1918, as the result of competitive bids, 4 per cent was paid. This rate has prevailed since that date.

All special funds are placed in open rather than savings accounts, in order that the interest may be compounded every month instead of every six months as is the rule in savings accounts.

J. G. CRAWFORD,
City Clerk.

March 10, 1924

BURKBURNETT, TEXAS

We secure unconditional competitive bids from local banks each year. Our daily balances for the past two years have averaged approximately \$90,000, a portion of which was improvement money which could be used any time the City Board of Commissioners might desire.

Last year we received 5.6 per cent on daily balances, and this year we are receiving 5.2 per cent. The city pays the premium on the bond required of the bank.

Our banks can afford to pay this rate, because they make good loans at 8 per cent. The banks have almost always been in hearty accord with the city's financial program, which sometimes has a bearing on the rate of interest offered municipalities by banks.

J. J. ENGELMANN,
City Comptroller.

March 10, 1924

To Confer on Traffic Problems

THE mayors of 411 cities and towns in New Jersey, New York and Connecticut within a radius of fifty miles of New York City and the presidents of 950 civic organizations have been invited to participate in a conference on the traffic problems of this area, to be held at the Town Hall in New York City, beginning at 10:30 a.m. on May 20. The conference will be held under the joint auspices of the following organizations:

Automobile Merchants Association
Bridgeport Chamber of Commerce
Bronx Board of Trade
Brooklyn Chamber of Commerce
Chamber of Commerce of the State of New York
Merchants Association of New York City
New Jersey State Chamber of Commerce
New Jersey State League of Municipalities
New York State Association
North Jersey Rapid Transit Commission
Queensboro Chamber of Commerce
Staten Island Chamber of Commerce
and the

Committee on the Regional Plan of New York
and Its Environs

The call for the conference points out that every city in the region of New York is facing

the difficult task of handling not only its own constantly increasing local traffic, but also that which flows daily to and from the larger cities in the region, particularly that which originates in, or is bound toward, New York City. The conference will consider not only the congestion of traffic, but the traffic accident situation, traffic costs, convenience of travel within the region of New York (or lack of it), the adequacy of existing bridges, tunnels, streets, and highways, the probable future need for wider, more numerous and differently located traffic arteries, and the whole relation of traffic problems to the contemplated Regional Plan of New York and Its Environs.

The mayor of every city in the region of New York has been asked not only to attend the conference personally, but to send city engineers and other officials whose duties relate to traffic. Similarly, the presidents of civic organizations are asked to attend personally and to request the chairmen of their traffic, transportation, accident prevention and city planning committees to be present also.

An Unsightly Spot Made Beautiful as a Result of City Planning



THE PREVIOUS UNSIGHTLY APPEARANCE OF THE RIVER AND BANK



THE TRANSFORMED BANK OF THE PICTURESQUE BRONX RIVER

These "before" and "after" views of the Bronx River Parkway, New York, are used effectively as a frontispiece to the recently published Preliminary Report of the City Plan Commission of Elizabeth, N. J.

His Community Honors Luther Burbank

FOR the last three years, the city of Santa Rosa has been at work upon a scheme for the development of a park in honor of its remarkable citizen, Luther Burbank, who has contributed so much toward the evolution of horticulture. This park was acquired by the citizens of Santa Rosa through a Park Commission especially appointed for this purpose, and with the cooperation of the city and the Chamber of Commerce.

The park contains approximately 39 acres of land, located at the city boundary, and is contiguous to the site on which is to be built a very beautiful modern high school. The park was planned with a view to symbolizing the work of Mr. Burbank, and will contain the following features of especial interest:

1. A section of a little less than an acre devoted to the raising of plants developed by Mr. Burbank, the planting of which will

be under his personal direction and supervision.

2. A central building with auditorium, library, and laboratory, the auditorium to be connected with an outdoor stadium hav-



A SECTION OF THIS PARK IS DEVOTED TO THE MODERN EVOLUTION OF HORTICULTURE

ing a seating capacity of about 5,000. The stage is so arranged that it can be used for spectacles with an indoor and an outdoor audience watching at the same time.

3. An outdoor theater, with a seating capacity of only about 300, to be devoted to outdoor meetings, lectures, and performances of various kinds.

4. A playground which can be used by the pupils of the high school or by those using the park.

The planting will be done in such a way as to be representative of the flora of central California. A rose garden for the great variety of roses that can be grown in California will be included.

The approach to the central building will be from the main highway. And between the building and the highway it is planned to place a statue symbolic of the work of Mr. Burbank. The statue was modeled by Roger Nobel Burnham, and symbolizes the human hand raising the level of the earth. The park design was carried out under the supervision of Dr. Carol Aronovici, city planning consultant, and lecturer in the Extension Division of the University of California, now residing in Berkeley.



THE HUMAN HAND RAISING THE LEVEL OF THE EARTH

Design for a statue symbolic of Mr. Burbank's work

Springfield's New Street and Transportation Plan

By Francis P. Ide

Secretary, Zoning and Plan Commission, Springfield, Ill.

THE comprehensive city plan recently prepared for Springfield, Ill., by Myron H. West and staff of the American Park Builders, of Chicago, provides for the future growth of this city to a population of 200,000, the present population being in the neighborhood of 58,000.

Based upon a comprehensive zone plan, the main thoroughfare plan was prepared, which in turn formed the foundation for a complete system of streets arranged with rectangular blocks on level lands and with curved streets along streams and ravines where high-class residence property is expected to develop.

The new platted areas for future growth embrace a total of about 10,500 acres, of which 2,100 acres are in the factory district. The present platted area of the city amounts to about 5,700 acres. After the new street plan had been prepared, with full consideration given to traffic flow, accessibility to main objective points, and proper land utilization, the city planner submitted the following estimate of the saving to the city which could be expected by use of the new platting:

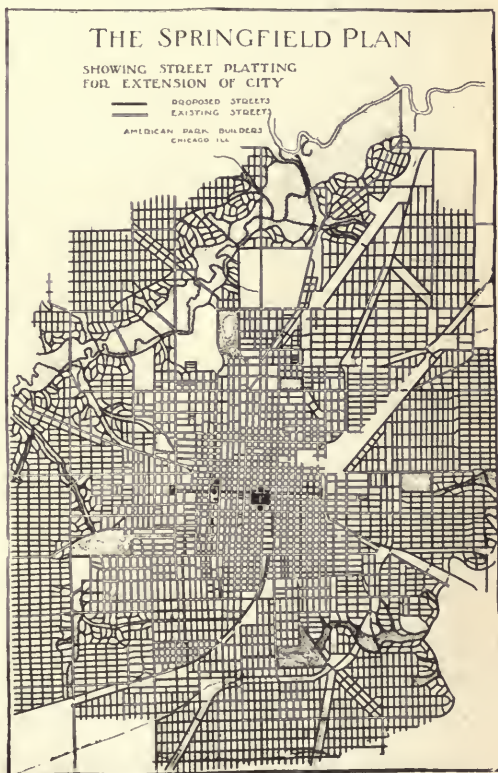
"The new platting uses for streets 27.94 per cent of the residential area and 20.74 per cent of the factory area, as against 36 per cent everywhere required for the old platting. This permits a saving of nearly a thousand acres, which, at 20 cents per square foot, would figure a land value of about \$8,700,000. Moreover, the new platting saves about 85 miles of streets, which figures a saving of about \$14,300,000 for street improvements; or a saving of about \$23,000,000 for both land and improvements. Based upon the expected population of 200,000, this would indicate a saving of \$5.75 in taxes per capita fifty years hence."

The street plan calls also for widening, opening and other corrections in connection with several existing streets, in order to make the city as a whole more convenient of use.

The railroad plan calls for the consolidation of three parallel lines which now extend through the city at short distances apart. The estimated total cost of this consolidation is approximately \$1,500,000, exclusive of the new passenger station and

freight yards. Ninety-two grade crossings would be eliminated and twenty-two miles of main track would be removed from the area affected. An annual saving in operating charges to railroads is estimated at \$260,000, which, capitalized at 5 per cent, would amount to nearly three and a half times the estimated cost of the entire improvement.

Street-car lines have been planned to extend into the future territory in such a way as to provide a complete system of through routes and feeders, bringing the car lines within 1,500 feet of every home and enabling transportation from any part of the city to the main objective points—the union passenger station, factory district and business sections—either by the use of a through-route car or with not



LIGHT LINES SHOW EXISTING STREETS;
DARK LINES PROPOSED STREETS

more than one transfer. Several changes in the present street-car lines have already been made, in conformity with the recommendations, and the general plan is based upon the economical extension of lines to give adequate service on a five-cent fare

and adequate returns on the investment. The plan provides for both comprehensive and immediate zoning, a fully balanced park and boulevard system, school sites, a capitol group, and for a Lincoln memorial group at the old Lincoln homestead.

If Job Had Been a Traffic Officer

By Frank H. Warren

Claim Agent, Chicago, South Bend & Northern Indiana Railway

EDITORIAL NOTE.—*The following is Number 7 of a series of articles by Mr. Warren which have been published by "The South Bend Tribune" in a daily department headed "Playing Safe in the Highways."*

A BUSY traffic officer resembles nothing so much as a small boy in a nest of hornets. He has about the same chance to get stung. The main difference is that the stinger in his case weighs anywhere from one to 35 tons and is capable of putting him in the cemetery or the hospital with one sting. If I were a traffic officer, I'd want to be a hundred feet underground and guide traffic with a periscope. I suppose these men were originally safety devices. If so, that object has long ago become of secondary interest. It is their main job now to move the traffic. They are a piece of the highway operating mechanism.

Stand on the corner during a busy hour and watch him work. It will make you dizzy just to look on. Two long strings of swiftly moving vehicles, four street cars turning four different corners, four streams of pedestrians who pay exactly the same attention to him that the moon does to my crop of beets, two impatient lines of standing vehicles with horns screeching in every tone from high C flat to low G sharp, nine autos making left-hand turns and surrounding him like the hungry pack around a newly elected president, while a young man demands instant information about how to go to 407½ East Condit Street, how far it is and does he know John Chiczywolinski. A traffic officer has about as much chance to breathe as a chicken under water; and like a whale he has to come up every hour for air.

If Job had been a traffic officer, he would have thought no more of his boils than an elephant does of the hives. When it comes to patience, a good traffic officer is so far

ahead of him that Job and his boils couldn't even see his tail-light. Yet if he fails to tip his hat to every bobbed head that passes or violates any of "Jones' Correct Rules of Parlor Etiquette" in six volumes he's a roughneck and ought to be kicked off the force. I've heard he sometimes swears, which is a wicked thing to do in the innocent ears of model auto drivers, but the surprising thing would be his failure to cuss.

There are a lot of ways in which we can add to the pleasures of his job. If he raises his voice above the well-modulated tone of polite society when you run against his "Stop" signal, tell your friends what a discourteous police force we have. If he doesn't give you a quick "Go" signal when he knows you are a friend of a street sweeper's assistant's cousin, complain to the mayor. If he won't let you make a left-hand turn, remind him that you have driven in Chicago and this is hick town stuff. If he asks you to get out of the way of the fire department, stand and argue with him and tell him you're the chief of the fire department yourself. Never give him an encouraging word or a pleasant nod or do a single thing to make his hard task less difficult.

And you, capable officer on a hard job, remember that not one out of every hundred offenders is a willful offender and that so long as you are efficient, even-tempered and decently courteous in the face of trying conditions, the good people of this city are ready to forgive and forget your honest mistakes and are with you. And the good people of this and every other city are always a good, comfortable majority of the whole.

The Economic Utilization of Land in City Building

By Robert Whitten

Cleveland, Ohio

IN all ages most mistakes in city building have come from too niggardly a use of land. The crowding of houses on the land, the crowding of many families into a single building, the narrow ways left for access to the buildings and for general traffic, and the omission of open spaces for play, recreation and the exigencies of the future, have made increasing congestion with its attendant serious evils a necessary incident to city growth.

At the time a city is founded there is nothing so cheap as the raw land. There is no reason why at that time adequate traffic ways and open spaces cannot be provided to take care of all possible future requirements. Such provision usually can be made without any sacrifice of convenience or comfort but with a great increase of pleasure and beauty in the lives both of the earlier inhabitants and of those who come after them. The only bar to its realization has been a lack of appreciation of the obligation we owe to those who are to come after us and for whom we hold the land in trust—and a lack of sufficient foresight to envisage the requirements of the distant future.

Human knowledge, either of the practical or of the organized and scientific variety, is as yet inadequate in itself for good city planning. It needs something more; it needs faith, foresight, imagination and at least a touch of inspiration; it needs an intuitive conception or breadth of vision that is not born solely of reason.

In many cases the natural comfort and beauty of the original town are unnecessarily sacrificed to the supposed requirements of city growth. The open spaces

about buildings provided in the development of the original town, in the interest of comfort, convenience and beauty, are later filled solidly with buildings. The detached dwellings setting back from the street are replaced by solid rows of apartments and tenements, coming out to the sidewalk line and crowding out the trees and the play space of the children. The three-story

business buildings are replaced by skyscrapers that are entirely out of proportion to the width of the narrow street and its capacity to provide light, access and appropriate setting for the tall buildings along it. Because of the alleged scarcity of land convenient to

A Fundamental Obligation

God has lent us the earth for our life; it is a great entail. It belongs as much to those who are to come after us, and whose names are already written in the book of creation, as to us; and we have no right, by anything that we do or neglect, to involve them in unnecessary penalties or deprive them of benefits which it was in our power to bequeath.—Ruskin.

the city, people are crowded into tenements with only narrow courts for light and breathing space; while as a matter of fact the only thing that prevents the spreading out of the population in detached dwellings is the congestion in the narrow traffic routes that slows down all transit and automobile traffic to and from the suburbs. If, as the city grows, a part of the lawn space in front of the detached residences were used for street widening, the population could be taken care of, for the most part in detached dwellings, and without resort to the congested tenement.

It seems to be almost a law of city growth that with the advance of civilization an increasing proportion of the land area is required for the various urban uses and services. The streets of ancient Rome would seem like alleys in a modern city. It may be that the streets of to-day will seem like alleys in the city of the future with its increased and modified traffic requirements. All improvements in trans-

portation and communication increase the volume of traffic and the space required to accommodate the transportation and communication services. The highways have had to be supplemented by canals, railroads, power transmission lines and oil pipe lines. In the modern city the street subsurface with its network of sewers, water, gas and steam mains, wire conduits, pneumatic tubes and rapid transit subways, is even more congested than the street surface. What demands for parking and landing space the air traffic of the future will make can only be vaguely surmised. One thing is certain, that the more open the present urban development, the easier the adjustment to future requirements; and though we cannot now foresee the exact nature of those requirements, we may be sure they will involve an increased need for open or un-built-upon areas.

With the automobile and the motor bus a much larger proportion of the population of our larger cities would now be enjoying the comfort of suburban homes, were it not for the failure of the street capacity to keep pace with the increased burden placed upon it. A really adequate street system and convenient areas for automobile parking and storage would quickly revolutionize housing and living conditions in our cities. With the present development of the art of transportation, the bulk of the population should live in single-family detached houses, and a very considerable portion of these should enjoy the advantage of semi-rural surroundings. The art of city building lags far behind the art of transportation.

We may be sure that future improvements in transport facilities and the increased movement of goods and people occasioned thereby, will make necessary the provision of wider traffic ways and much more adequate storage and terminal facilities. Unless we provide in present planning for a much more open development in and about our cities, future needs can only be met at an almost prohibitive cost.

Our Only Hope of Substantial Relief

The suburban or satellite town offers our only hope of substantial relief from the increasing congestion incident to the ever-growing bulk of the great city. A suburban town near a great city offers the oppor-

tunity for almost ideal living and working conditions. But, judging from the past, the suburban town of to-day will to-morrow become an integral part of the great city. Its individuality and its suburban characteristics will be lost in the engulfing sweep of the great city proper.

A great city like the London or New York of to-day is made up of many one-time suburban communities that have gradually grown together. Their former boundaries would now be difficult to trace. Their physical and in most cases their political identity have been lost. In some cases this is proper and inevitable. In general, however, the sweeping of the great city over the smaller and the obliteration of its physical or political identity or both have had unfortunate results both economically and socially.

It should be possible so to plan the industrial suburb that its industries will not be driven out by high taxes, by lack of room for expansion, or by the crowding out of its supply of efficient labor through high rents and congestion. A first essential is a permanent physical barrier to the engulfing sweep of the great central city. If no natural barrier such as a broad river exists, an artificial barrier should be created.

Ideally, the central commercial city should be surrounded by suburban or satellite cities. The central commercial city should have an area of 50 to 100 square miles, and this area should be surrounded by a strip of park, farm or other open development use about one mile in width. Each satellite city, whether industrial or residential, should be laid out with an area varying from 4 to 25 square miles and for a maximum population varying from 5,000 to 250,000. An open development strip from one-half mile to one mile in width should separate each satellite from its neighbors.

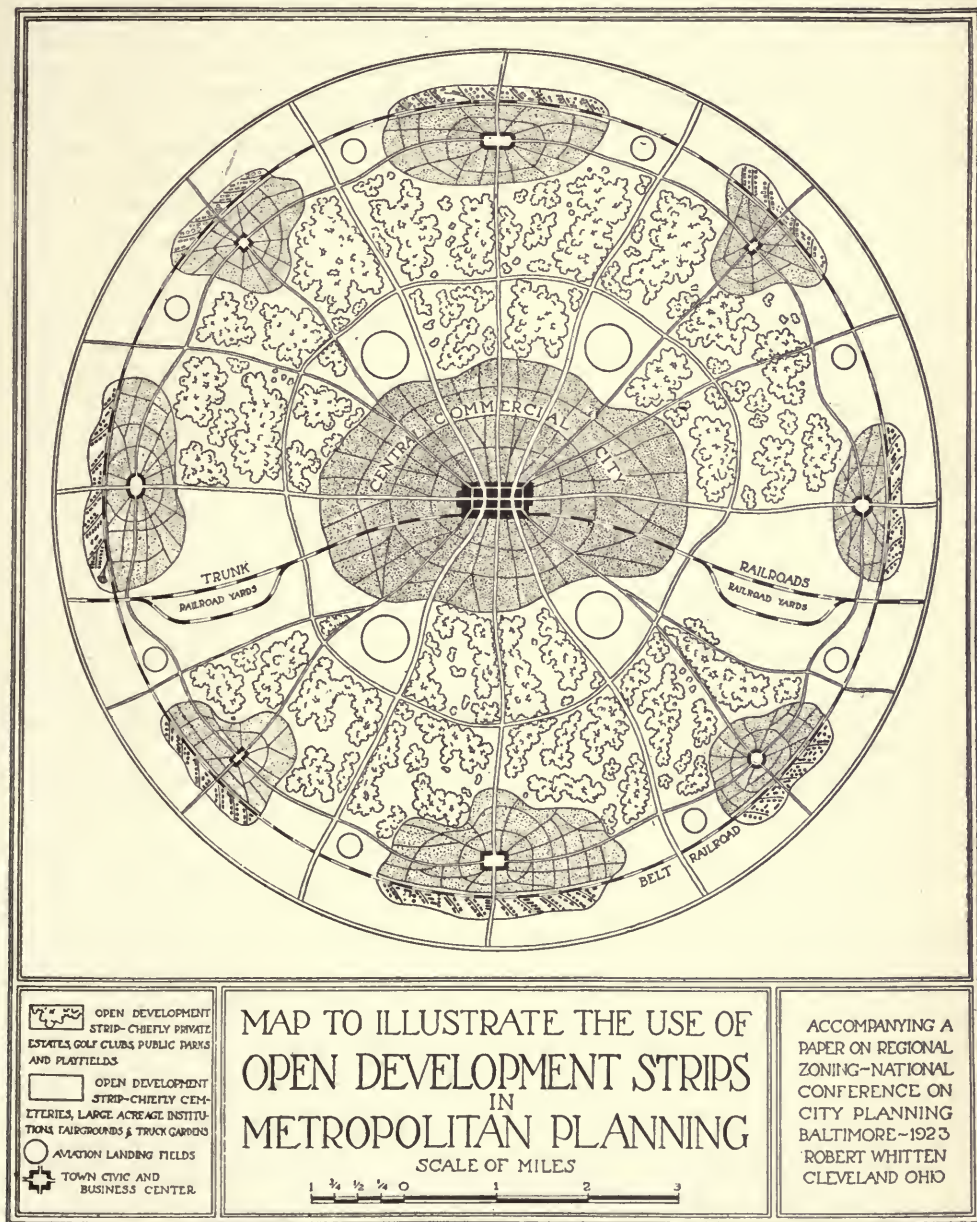
It may be thought that, by placing an absolute limit on the outward expansion of the central commercial city and of its tributary, industrial and residential satellites, all progress and development will be stopped when these limits are reached. As a matter of fact, sound development will be promoted rather than retarded or stopped. As the older satellite cities are filled up, new ones will be created. The great difference will be that the new devel-

opment will not destroy or render obsolete the old development. Each part of the metropolitan region will benefit by the growth of other parts, and all this growth, wherever located, will increase the business and prosperity of the central commercial city.

How an Encircling Strip Can Be Used

The encircling open development strip need not remain idle or restricted to merely

agricultural uses. Almost any use that requires large acreage and a small percentage of cover and that does not draw large crowds of people to it daily can be properly included. Among the uses other than agricultural that seem appropriate are: large parks, parkways, playfields, forest reservations, golf and country clubs, private estates, cemeteries, water-supply reservoirs and filter beds, air terminals, city, county and state farms and institutional buildings,



private institutions occupying large acreage, fair grounds, sewage treatment works, truck gardens, greenhouses and railroad car storage and classification yards.

In addition to the specific uses of the open development strips indicated above and the maintenance of the integrity of the satellite cities, the preservation of these wide semi-open strips will prove useful in many ways. They will block the spread of conflagrations. They will furnish economical routes for future railroads and railroad belt lines, electric power transmission lines, oil pipe lines, water-supply tunnels, inter-urban railway and bus lines, high-speed trucking and automobile roads, and airplane courses. As routes for airplanes with frequent landing and parking spaces, they will aid in the practical application of this great invention to city life and work. When the airplane is at length "Fordized" and each man has his "flitter," these open development strips may have a new and rather intensive sort of usefulness.

"The Fitting of Form to Function"

True art gives the short cut to the best solution of many problems. The artist knows that each building should have its setting, each dwelling a lawn and garden about it, and that similarly the closely built-up portions of each town should be surrounded by a green belt of open country. The artist, too, designs the great university as a unit but with a campus and with open grounds and with a setting and individuality for every building. So, too, the great city should have its central city and its suburban towns, all with spacious grounds about them, giving them dignity, individuality, breathing space and permanence.

Art is but "the fitting of form to function"; and the truly useful and the truly beautiful are one and the same. We may be sure that there is something lacking in the economy and utility of our design if it does not show the line of beauty. A design that appeals strongly to our sense of beauty is apt to have in it greater real economy and fitness to function than one that has resulted from a hard-headed adherence to obvious, immediate needs. The perception by a community of real beauty in a design of city building is the result of intuitive insight and is more to be trusted as a guide to community development than the more obvious design related strictly to immediate needs. Park systems have been developed by American cities more through trusting this instinct for beauty than from any reasoned appreciation of the recreational and spiritual value of the park in the life and growth of the community.

It is our instinctive love of order and beauty that often guides us to the truly useful. With harmony and beauty as a guide, we build more wisely than we know. But we must let this instinct guide us, and not attempt to control and guide the instinct; for if we do, we may get only the dead husks of what once was beauty. A community sometimes imitates the styles and forms of ancient Athens or Rome in its too conscious quest for civic beauty, instead of permitting beauty to come as naturally as does the glow of health to a sound and vigorous constitution. The city beautiful is the spontaneous product of the city vigorous, healthful and efficient, and the city efficient is a no less necessary concomitant of the city orderly, harmonious and beautiful.

Woman's Club Has Symposium on City's Needs

THE Good Citizenship Bureau of the *Woman's Home Companion*, conducted by Anna Steese Richardson, reports that recently the Atlanta Woman's Club held a community meeting which drew throngs to its handsome building. "The attraction was a symposium on 'Citizenship,' or 'What Does Atlanta Need?'" All civic and patriotic organizations, the City Government, and the County Commissioners were represented. Thirty speeches of five minutes' duration each were made and a decision rendered by three judges as to the three greatest needs of Atlanta. The first was Education, meaning better public schools; the

second Parks and Playgrounds, and the third City Planning, looking fifty years into the future instead of five. Every need of the city, or indeed of any city the size of Atlanta, was brought out, and at the close of the meeting one thousand crêpe myrtle trees (indigenous to this part of the South) were presented to the club, to be planted wherever, in the wisdom of the Planning Committee, they will most beautify Atlanta. This program might help club workers in other communities. For particulars of this extraordinarily successful evening write Mrs. Alonzo Richardson, 946 Peachtree Street, Atlanta, Ga."

Financing Water-Main Extensions

By H. F. Blomquist

Superintendent of Water-Works, Cedar Rapids, Iowa

THE pipe system of a municipal water-works may be divided into two main classes—the distributors and the feeder mains. The distributors are the gridiron arrangement of small mains, usually 6- or 8-inch pipes serving the individual fire-hydrants and blocks of consumers located along the various lines. The feeder mains are the large pipe lines which conduct water from its source to the various sections of the city to supply the distributors.

The distributors are of value only to the abutting property owners whom they serve with water and to whom they furnish fire protection. In general, an extension of distributors does not add to the usefulness of the water system except as a means of serving the particular owners who may make connections with it. In other words, they are set apart for the use of a certain group of individuals, and cannot be used by any other group. In this respect they are different from all other parts of a water system. The source of supply, pumping machinery, purification plant, etc., serve all consumers in common, as the needs may be, and improvements or additions to them are equally valuable to all people served by the water system, but this is not so with improvements or additions to the distributors.

The pipe system of a water-works represents from one-half to three-fourths of the total investment in the plant, and the small pipes, or distributors, represent the greater portion of the ordinary pipe system. An increase of 100 per cent in the cost of water-main construction in a short time, together with an increasing demand for water-main

extensions in rapidly growing cities, has made the financing of extensions a major problem, especially in Iowa, where there is as yet no authority for financing them by frontage tax or a special local assessment against the benefited property.

Financing by Assessment

Because of the large investment necessary in distributors, and recognizing the fact that they serve only a certain group of individuals,

most of the states have passed statutes, which are upheld by the courts, that permit municipally owned water-works to charge all or a portion of the cost of such extensions to that group. A common practice in those states is to make extensions upon petition of the owners of a majority of the abutting property, and make an annual assessment, usually of 5 to 10 cents per front foot of abutting property, for a period of ten years. Another method used is to make direct special assessment of from two-thirds to the total cost of the extension and certify for collection in yearly installments according to the governing laws. The de-

tails of the plans are left for each municipality to work out according to its own preferences.

Advantages of Frontage Tax System

There are several advantages of the special assessment or frontage tax system for financing main extensions, among which are the following: Extensions can be made into new and sparsely settled territory without loss to the water department, and people who would otherwise not be able to get the benefit of public water service may have it at a nominal

Who Pays and How?

The function of a public water-works is to furnish various services to the inhabitants of the community in which it operates. The total cost of furnishing these services must be paid by those who receive them. This applies to municipally owned plants as well as to those owned by individuals. In order to make equitable charges for the different classes of service furnished, such as water for domestic use, industrial use, fire protection and other public uses, the costs are analyzed into their various elements, and one of the large elements is an overhead, or fixed expense, due to the large investment in the distributing system, or pipe lines, for bringing the water from the source of supply to the consumer, who may be many miles away.

There are some fundamental differences in the methods that may be used in dealings involving financial matters by municipally owned and privately owned utilities. This paper deals with the problem of financing water-main extensions by municipally owned plants.

expense, usually much less than any other water-supply would cost them. Parties interested in opening new additions can have extensions made without being obliged to guarantee incomes, or to pay interest on the investment in a direct way, or to put in water-mains at their own cost.

Other Methods and Relative Advantages

Where special assessments or frontage tax is not permitted, water departments have resorted to various other methods of dealing with main extensions. Some cities make extensions under contracts with owners of property, by which the owners guarantee an annual income of a certain percentage of the cost of construction. Others require the land-owners to make the extension at their own cost, and when a sufficient number of connections have been made so that the revenue equals a certain percentage of the cost, the water departments will take the extension over at construction cost, or valuations to be made according to contract stipulations. These systems have worked fairly well where ownership of property is vested in one or two parties, but where lots have been sold to individuals, this arrangement becomes difficult and cumbersome and can rarely be used.

Whether a system of assessment of costs in main extensions is followed by which a portion of the income for water service is derived, or whether some other method is used, the fundamental principle remains that the consumer must eventually pay all costs of the service. There are, however, some decided advantages in one system over another, due to differences in business procedures necessary to provide the required funds. Where no form of assessment or tax for mains is used, all the costs of extensions must come in the form of water service charges, and since the outlay in mains is necessary long before income from them is available, the department must resort to the issuing of bonds or other form of indebtedness for carrying the investment until the returns from it will be sufficient to liquidate them. Frequent issues of bonds are undesirable, and often hard to bring about where popular vote is required, and are more costly than the more direct way of partially paying as you go. On the other hand, when charges are made in one form or another as soon as mains are laid and services available, the financing of extensions becomes greatly simplified.

It must be considered, however, that if a part of the income is derived from assessment or taxes, the rate for water sold should

be correspondingly lower. It is simply a method of dividing the cost of service into two parts, one of which is payable as soon as water service is available, and may be considered as a ready-to-serve charge; and the other part payable when water is actually used. Courts have sustained ready-to-serve charges in public utilities other than water service, but the principle involved is the same whether it is water, gas or electricity.

Some just objections to making a change from a non-assessment system to the other might be raised on the ground that owners of property along which future mains are to be laid will be required to pay more for water service in the form of assessments or frontage taxes than owners where mains were laid before, who got them without any extra expense. These differences would not be great, however, and are offset to some extent by the older consumers' having paid a greater portion, in some instances at least, toward the purchase or building up of the water plant.

In order to simplify the financing of water extensions, and yet overcome objections to an abrupt change from a method of no assessment or charges, to one which involves special assessments or taxes, a proposed law was introduced in the Iowa Legislature at the last session, but failed to pass, which provided for assessments against the benefited property in an amount equivalent to the cost of a 6-inch main, but with this difference from the ordinary methods, that after a property owner made connection to the mains, and became a regular consumer, the amount of assessment paid would be refunded to him. This method would simply throw the burden of carrying the investment of water-mains in unproductive territory upon the property owner until he would require water service. This principle can be defended on the ground that after water is available the property would be increased in value to fully offset the expense of carrying the investment. In reality, it would be only a ready-to-serve charge for the assurance of being able to have water service, which would be of actual value to the property owner.

Based upon experiences with the problem of financing extensions under both methods, it is the writer's opinion that the ready-to-serve charge or assessment plan for municipal water-works meets the requirements much better because it distributes the cost of service more equitably and makes it possible to meet the needs of water-service extensions much more readily.

Do Your Meter Readers Read Meters?

Maywood, Ill., Increased Revenue 30 Per Cent by Careful Checking Up

ACCORDING to Lawrence W. Cox, Village Manager, Maywood, Ill., in a recent issue of the *City Manager Magazine*, the fact that a city has meters does not necessarily mean that they are being used effectively. In June, 1923, it was discovered that, except for the large meters, only about 10 per cent of the water-meters in Maywood, a city of 18,000 population, had been correctly read during the last three years. One man had read substantially all meters for years and, having carried the previous readings with him on his cards, found it comparatively easy to make estimated readings look consistent.

What this failure to have correct readings meant to the water department can only be estimated. The amount of unrecorded water which had passed through the meters ranged through all amounts up to \$100 per meter. For 3,500 meters the loss is estimated at about \$40,000. The quarter following the correct reading of the meters there was an increase of revenue of about \$900, which can be credited solely to correct meter reading. Of course, this gain will not continue very long, because customers are learning to waste less water, and, this waste once checked, the bills will be smaller, but the dollars-and-cents gain in actual revenue will continue to be considerable, and the waste thus eliminated will result in a saving in pumping and maintenance costs.

Another gain is the saving of water which is already being effected. This means a more adequate supply of water available, which is very much needed, without additional invest-

ment in wells and plants. That there had been a large amount of waste is seen from the fact that for the first set of accurate quarterly readings in each of the three meter sections, a number of water bills amounted to \$10 and \$15, a few \$45, and one \$100. In most of these cases a normal consumption would not have exceeded \$4, and in no case would it have exceeded \$10.

Regardless of public comment and warnings, there are a large number of consumers who continue the use of defective fixtures which constitute the principal cause of these large bills, and they will continue until the large bills come directly home to them. However, the excessive waste is being checked. The first set of second-quarter bills of correct readings show a noticeable absence of the extremely large charges. The very large bills, of course, created resentment among many of those affected. Everything is being done, however, to offset or neutralize this feeling. Before the office presents the large bills, the meter reading is checked, the previous quarterly reading is examined to see that it appears consistent, and then the premises are examined for defective fixtures or other causes of heavy usage. In the more extreme cases a test of the meter is made in place. Endeavor is made to have the consumer witness the test of the meter and to explain to him that the examination and test are being made because of the large water bill and that the water department is doing everything in its power to help him locate the trouble so that he may not be overburdened with another large bill.

Washington, D. C., Adopts New Load Limit for Motor Trucks

FOLLOWING hearings that have been in progress for several months, the Commissioners of the District of Columbia have decided to establish a limit of 28,000 pounds for loaded motor trucks. This decision is in line with recommendations submitted by the Bureau of Public Roads made by its Chief, Thomas H. MacDonald. It is also in accordance with the standard policy of the Motor Vehicle Conference Committee.

"Probably \$25,000 annually is saved by the Federal Government in the transportation of fuel in 7½-ton trucks as against 5-ton units in the city of Washington," testified G. F. Pope, Engineer in charge of the Government Fuel Yards, Department of the Interior, before the Commissioners at one

of the recent weight limitation hearings. That weights of vehicles traveling over the highways should be those which provide the most economical transportation, and the fact that with the same weight distribution the difference between a 25,000-pound limit and a 28,000-pound limit is so slight that it has no appreciable effect on the highway or street, was brought out by representatives of the Bureau of Public Roads. Emphasis was laid upon the need for enforcement of present regulations to prevent overloading. This the Commissioners declared impossible and asked for an agreement among the truckers as to what would be a proper penalty for violation of overloading regulations.

Uniform Danger and Caution Symbols for Canadian Highways

By George A. McNamee

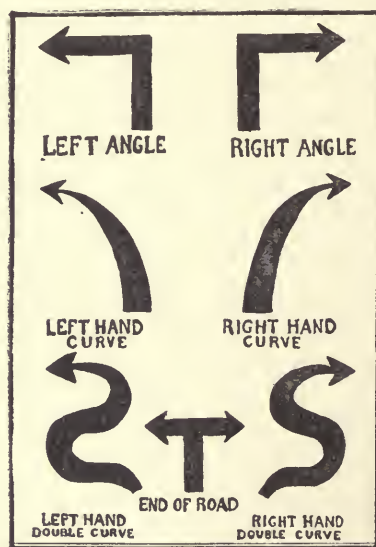
Secretary, Canadian Good Roads Association

A DISTINCT step forward in ensuring the safety of the highways has been achieved as a result of the Interprovincial Conference of Highway Officials held in conjunction with the Canadian Good Roads Association. At their last meeting, held in Winnipeg, a series of resolutions dealing with the uniformity of caution and danger signs on public roads were unanimously passed, and were submitted by the delegates to their respective governments. Word has now been received that practically every province in the Dominion has endorsed these decisions and will take the necessary steps to put them into effect. All the eastern and most of the western provinces have adopted the uniform symbols, and at the coming convention of the Canadian Goods Roads Association at St. Andrews by the Sea, on June 24, 25, 26 and 27 next, a further conference of provincial highway officials and engineers will be held to discuss other matters of uniformity regarding the use of the highways and the administration of departments on uniform lines with a view to securing greater efficiency and economy.

The resolutions arrived at by the conference included the adoption of the uniform caution and danger symbols here shown.

The symbols will be not less than 3 inches in width, tapering off with an arrow, painted black on a white background on boards 2 feet square, erected on posts on the right-hand side of the highway so that the bottom of the sign shall be not less than 5 feet or more than 6½ feet from the level of the traveled portion of the highway adjacent to the sign. They will face approaching traffic at right angles with the highway, as close to the edge of the traveled portion of the road as possible, and are to be located at a distance

of 300 feet from the point of danger. In cases where the local surroundings will not permit of the erection at this distance, the selected location shall be not less than 300 feet. A special sign bearing the words "Narrow Bridge," placed at a distance of 300 feet, will warn vehicles approaching a highway bridge of a width narrower than the roadway.



White Lines on Pavements

The conference also favored the painting on the center of hard-surface roadways of a white line 4 inches in width the full length of the curve, to assist traffic to keep to the right of the center, especially at night, and thus aid in the prevention of accidents. A further resolution was that only such signs for the direction and safety of the public as may be approved by the Provincial Government may be

used within the boundary of any rural highway or road, and that as regards streets and roads which, although situate in cities and towns, form a continuation of the rural highway or a connection between rural highways, the co-operation of such cities or towns be obtained with a view to uniformity in the sign-boarding of such streets and roads. The putting into force of these regulations will be a real boom to all travelers and will do much to ensure safety on the highways and remove many conflicting and useless signs that now clutter them.

EDITORIAL NOTE.—For a study of Traffic Control and Facilitation especially in relation to cities, readers are referred to Section 14 of The Municipal Index for 1924. The importance of safeguarding grade crossings, pending their total elimination, was emphasized in the 1922 report of the Committee on Traffic and Transportation of the American Society for Municipal Improvements with the following recommendations: "The width of all roadways crossing railroads should be at least 20 feet. For a distance of 100 feet on each side of the railroad the grade of the highway should be level or not over 2 feet rise or fall in 100 feet."

The Extent of Centralized Purchasing in American Cities

A Survey of the Number of Cities Practicing Centralized Purchasing in Each State and Province

By Russell Forbes

Research Secretary, National Association of Purchasing Agents, New York City

AN exhaustive survey has been under way for over a year to determine the present extent of centralized purchasing in American cities. The latest figures show that 196 cities with population over 10,000 in the United States and Canada have provided the necessary legal authority to establish a central supply procurement system. Of this number, 172 are cities of the United States and 24 of the Dominion of Canada. Cities of less than 10,000 population have not been counted, for it is thought that little, if anything, can be saved by centralized buying for smaller municipalities. Many towns of less than 10,000, however, now follow this plan. Some additional cities with a central buying agency may not yet have been located by this survey. But at least 196 may be so classified.

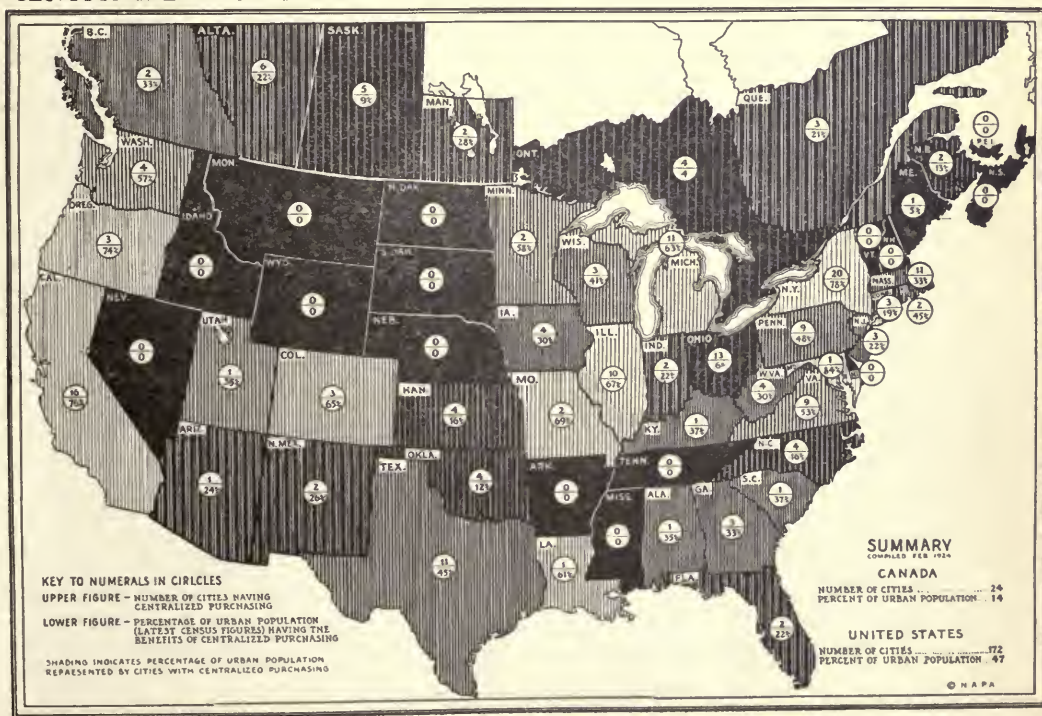
The present extent of the plan is all the

more noteworthy in that it is almost entirely a product of the present century. The first municipal purchasing agency to survive the experimental stage was established in 1896.

In several cities centralized purchasing exists in name only. The necessary charter or ordinance provisions have been enacted, but the law has been disregarded on account of "politics," an unsympathetic attitude of the administration and department heads, or for divers other reasons. But for the most part centralization is a vital factor in the supply system of the cities embraced in this discussion.

The Department of Education in many cities is practically autonomous. Educational supplies are almost universally bought independently of the regular municipal agency. In some of the larger cities, such as Cleveland,

OUTLINE MAP SHOWING PRESENT EXTENT OF CENTRALIZED PURCHASING IN CITIES OF UNITED STATES AND CANADA



the Department of Education maintains and operates its own supply bureau.

The city manager movement has been a powerful factor in the spread of centralized buying. It is only natural that supply procurement should be centralized by city managers along with other phases of the government. Of 100 city manager cities in the United States and Canada of over 10,000 population, 79 are known to practice centralized purchasing. In most municipalities under 25,000 population, the city manager himself does the buying for the city. In the larger cities, a purchasing agent is usually appointed by the city manager or by the head of the finance department.

The accompanying map has been prepared especially to show the present extent of centralized purchasing in municipal government. A circle is superimposed on each state or province to show the extent of the plan in that area. The upper figure in the circle gives the number of cities in that state or province with legal provisions for centralized purchasing. The lower figure gives the ratio of the total population of those cities to the total *urban* population of the state or province. For example, 11 cities in Michigan follow the centralized method of buying. The total population of those 11 cities equals 63 per cent of the total population of *all* cities of Michigan. In the province of Ontario 4 cities with cen-

tral purchasing agencies are equal to only 4 per cent of the total *urban* population of the province. The shading and vertical lines are intended to convey this fact graphically.

The relationship of the city manager movement to centralized purchasing is apparent from the record of California, Michigan, and Texas, as shown on the map. These states, which lead others in number of city manager municipalities, are also near the top in number of cities with central agencies of purchase.

The following table classifies the cities of the United States with centralized purchasing into six population groups, according to the latest available census figures (the Census Bureau estimates for 1922). It shows the total number of cities in each population group, the total number with centralized purchasing in each group, and the per cent of this number to the total number in the group:

Population Group	No. of Cities 1922	No. with Centralized Purchasing	Per Cent with Centralized Purchasing
10,000- 30,000	459	75	16%
30,000- 50,000	107	31	29%
50,000-100,000	79	19	24%
100,000-300,000	52	29	56%
300,000-500,000	11	7	68%
Over 500,000	12	11	91%

Centralized purchasing is just in its infancy in American cities. But the present extent of its practice in both the United States and Canada shows that it is already a "going" factor in modern municipal administration.

Circulars and Newspaper Questions and Answers Replace Annual Reports

To the Editor of THE AMERICAN CITY:

The suggestions appearing recently in your columns regarding the publication of annual reports have been inspiring.

I have always felt that the publication of an annual report in considerable detail has been an expense to the city which does not justify itself in any substantial return. We are all agreed that the great majority of citizens neither get nor are interested in the usual municipal report. The size of the publication itself discourages the citizen before he opens it.

Though we in East Cleveland have not gone all the way, we have started in what we believe to be the right direction. During the past year we have been publishing, whenever the occasion provides, a circular informing the citizens what we have done or intend to do and what results the administration of their affairs has attained. These circulars are made as brief and attractive as is reasonably possible and are distributed by boys to every residence.

I think that an additional interest might be stimulated to insure the saving of these circulars, by offering the readers a cheap loose-leaf folder in which the circulars, all of the same size (8½ x 11 inches), can be filed. Such folder covers, with rings, can be obtained by the city at about three cents each. The residents desiring them

could be required either to call for the folder at the City Hall or to write for it. The addresses thus secured would provide a list of the most substantial citizens, which would come in handy in many ways. Many interested citizens and supporters would thus be discovered who were not previously known by the administration.

As another means of stimulating interest in city affairs, we have provided a list of one hundred questions and answers—which could be enlarged indefinitely—three questions to be published in the local newspaper each week. The questions ask about various features of the city government. The following week the answers are published, along with three additional questions. The circulars and the questions and answers could both be used effectively, I believe, in connection with the teaching of civics in the schools.

The compilation of a hundred questions and answers is supplemented by a summary of our various public service contracts and franchises, and to this are added copies of each circular letter which has gone out to the citizens. These are bound in the office and serve as immediate answers to the great number of questionnaires which we receive regarding the administration of city manager government in our city.

PAUL B. WILCOX,
Assistant City Manager, East Cleveland, Ohio.

Low Tax Rates, Large Utility Earnings

By Richard Biehl

City Manager, Village of Westerville, Ohio

EDITORIAL NOTE.—*Whether it is sound practice to finance a municipality largely from profits of its public utilities is a debatable question; but Westerville, Ohio, seems so well pleased with this method of reducing the tax rate that the City Manager has furnished, for the benefit of THE AMERICAN CITY'S readers, the following outline of financial methods and recent public improvements in this thriving Ohio village. Westerville's population in 1920 was 2,480. It has been operating under the commission-manager form of government for the last eight years.*

THE citizens of Westerville are somewhat elated over their low tax rates and the fact that the major operating costs of the municipality are paid from the earnings of its utilities.

For the year 1923 the total expenditures for the operation of the various departments, including sinking fund requirements, were \$82,235. A tax was levied that would produce \$16,700. Only 4 per cent of the tax money was used for operating expenses, and 96 per cent was placed in the sinking fund to be used for the redemption of bonds and for interest requirements. The city earned sufficient money from its utilities to pay all of the major operating expenses, including the sala-

ries of the city manager, his assistants, and secretary, and to pay for \$13,600 worth of improvements.

Westerville has its own water plant. Electric current is purchased wholesale and is retailed for power and light through a municipally owned distribution system. All water is pumped with electric motors at a big saving over the old way. No charge is made on the village books either for water for municipal purposes, or for current used in street lighting, and the schools are supplied with water gratis.

The rates charged to consumers for water are \$2.00 per 1,000 cubic feet up to 15,000 feet, and \$1.75 per 1,000 for all over 15,000



GLENWOOD DRIVE, WESTERVILLE, OHIO

feet, with a minimum charge of \$2.00 a quarter. Readings are taken quarterly.

Electric current is sold by the village at an average charge of 4 cents per kw. hr. to citizens, 10 per cent being added for all current sold outside the village limits. Farmers in the vicinity of Westerville have subscribed more than \$6,000 for electric lines to be constructed by the city and to become its property. None of the money paid by the farmers for the construction of these lines is refunded.

Westerville purchases its current from a privately owned Columbus plant and pays most of the operating expenses of the village from the net earnings, although selling current at rates averaging 3 cents per kw. hr. below the consumers' rates charged in Columbus.

Recent bond issues for public improvements are all issued for short terms, resulting in substantial savings in interest payments. The sinking fund is in an excellent condition, and is building up a big surplus each year. It takes 65 per cent of the present tax money to meet obligations on bonds which were issued between 15 and 22 years ago. These old issues have been refunded and placed on a serial plan basis, with a saving in interest of more than \$65,000 on these old issues. Under the present plan of financing, interest payments are decreasing at the rate of \$1,500 a year.



CARNEGIE LIBRARY IN WESTERVILLE

Every city employee is well paid, and each one must live up to a certain standard or be replaced by another. Although the city's business has increased more than 50 per cent the past two years and duties have multiplied, by practicing efficiency the expenses are very little higher. This has been made possible in part by the use of the latest and most modern equipment to facilitate the work of cleaning the streets, in laying sewer and water lines, to remove rubbish, and in the execution of all city work.

Westerville has many of the facilities of the big city, and is known as the "biggest little city" in central Ohio. The following are some of its improvements: ninety per cent of its streets paved; sewer and water on almost

every street; light and power on every street; all streets well lighted; a new sewage disposal plant; a new water filtration plant under construction; its own electric distribution system; its own water-works; a good system of schools, including a new \$200,000 high school; good sidewalks; and a community hall. Westerville has motorized fire and police departments. Fire losses and insurance rates are low. The police department is supported by the local business men, who pay a certain sum each month when they pay their light bills. The accounting system is one of the best, with an accurate set of



WESTERVILLE JUNIOR-SENIOR HIGH SCHOOL

records, and with the latest facilities for rendering statements and keeping a constant check on power, light and water consumers.

Westerville banks bid as high as $4\frac{1}{3}$ per cent on the excellent balances now maintained. At the beginning of the year 1923 there was a balance of \$448.81 in all funds. We placed only \$652.35 of tax money in the operating funds and at the close of the year all current

bills and \$13,600 of improvements had been paid for, and more bonds retired, and we had \$17,000 cash in the bank. Our funds were secured by making each department pay its own way and from the net earnings from the utilities.

We have planned to place all tax money in the sinking fund this year and use earnings and fees for operating expenses.

A Crusade for Better Childhood

By William A. McKeever, A. M., LL. D.

Lecturer on Juvenile Problems

SIXTEEN towns, all within a radius of 40 miles from Chicago, are engaged in a friendly contest to determine which of their number may prove to be the best place in which to rear the young. This is the same type of campaign which I conducted twice in the state of Kansas and more recently as a state-wide project in Oklahoma. In order to stimulate interest in the present movement, the *Chicago Evening American* has posted a prize of \$1,000 to be awarded to the winner. The contestants are these:

Barrington.—A live country town, with a well-managed system of schools, a progressive and self-directive citizenship, healthy conditions as to churches and community life, and comparative freedom from city influence.

Berwyn.—A close-in suburban place that is fighting ably for independent self-direction of its civic and moral life; possessing an effective community-service organization, ably managed health work and parent-teacher affiliations with all schools.

Blue Island.—A semi-industrial population, with excellent advantages as to schools, women's and parents' clubs, a church conducting a regular civic forum, many other organizations helping with the common welfare, and a splendid paper supporting all.

Desplanes.—A town which has long stood for a high moral conscience, for well-supported churches, for self-discipline of pupils in the high school, for women's clubs with a zeal for service, and for an ideal suburban existence.

Downers Grove.—A town with homogeneous, rural-minded population; having a civic club which unites all factions, a progressive school system, excellent kindergarden service, well-filled churches of many denominations, and a central committee to manage the campaign.

East Chicago.—A big, thrifty industrial town, with all schools on the departmental plan, Boy Scouts assisting as traffic officers, a wide-awake chamber of commerce, music, and gymnasium instruction in the schools, and women's clubs supporting all juvenile movements.

Elmhurst.—A town of attractive homes and pride in home life of the young; a Lions' club conducting a civic forum, a community church

furnishing a social center for all, a high school that is well managed and enjoying the seclusion of the country, and excellent churches.

Hinsdale.—A town which has succeeded in uniting its grade and high school systems, with music, gymnasium practice, and the manual arts as features; a union church having a Sunday School of 800, and a system of caring for the morals of all the young.

Forest Park.—A place of wide-awake civic interest; with a Kiwanis Club which directs much of the civic life, with a women's club which studies and supports better home conditions for the young, and a school management which links up with the affairs of the community.

Glencoe.—A restricted residence community; having a club of business men which meets weekly to consider community welfare, a union church which serves many denominations, a public school wherein the children largely rule themselves, and many advantages for clean child life.

Glen Ellyn.—A town well set apart from the big city; with a high school that has become conspicuous for its support of the after-school interests of its pupils, churches which ably attend to the religious needs of the young, and a helpful weekly newspaper.

Hammond.—A thriving industrial center; with a chamber of commerce and women's clubs giving able support to the child welfare work, with public school management that has attracted national recognition, with moral ideals functioning in the schools and with able daily papers.

Harvey.—A town of long-standing ideals of citizenship; having a chamber of commerce with many civic achievements to its credit, a women's club featuring child study, a grade-school movement for better morals, and a high-school program of country-wide fame.

La Grange.—A close-in town where the home life comes first as a consideration of well-being; a civic club of men and women assuming directive control over all community movements; a woman's club that conducts child welfare work with the seriousness of a school.

Waukegan.—A hustling, well-balanced community; having exceptional schools and school equipment, churches featuring juvenile work, a complete continuation school, civic organizations assisting with all worthy movements, two daily papers, and a working committee of 100.

Wilmette.—A high-grade, restricted residence community; having a Sunday Evening Club of wide repute, which peculiarly unites all churches, a junior police force assisting with city government, modern public and parochial schools, and a complete system of Sunday schools.

The Central Problem

As director of Better-City campaigns, I have found the central problem to be that of cooperation and coordination. Practically all these places have an ample number of organizations, and they are sufficiently interested to take proper care of their growing young. But the work is nowhere well tied together in a single, effective movement. We recognize the four old and well-established institutions as being responsible for the care and management of the young, namely, Home, School, Church, Community. If any one of these fails, all must find a lower level: but if all act consciously together, the well-being of the child and the youth is reasonably assured.

The contest is running through an entire year and will presumably close about the first of June. I visit these places by turns, or send a representative, meeting committees, addressing clubs of men and women, inspiring the workers, arranging for publicity, and organizing the movement centrally. The majority of the towns on the circuit have given me the advantage of one or more central gatherings, where the Better City Campaign was explained.

Recently, the majority of the places have sent in for publication in the daily press a list of their "ten best points" as child-fostering communities. Some of them have arranged large bill-boards to be displayed along railways and to announce the virtues of the places, while a few have even gone so far as to send large beaver-board posters to be set up in a display window in the Loop district of Chicago. The *Evening American* has given splendid support to the campaign, with scores of press items, and with numerous photo-pic-

ture illustrations. This paper well appreciates the fact that child life may be made sufficiently attractive to become worthy of news column display.

Finally, in order to give the movement specific guidance, I have sent out to all the working committees a complete list of suggested projects intended to make the effort easier and more effectively coordinated. The interest in the campaign has grown slowly but solidly from the first, and I believe that the effort has been entirely worth while.

The Score Sheet

The score card which will be used as the basis of competitive grading of these towns on about the date of June first, follows:

1. Facilities for play and athletics, about the home, the school and the community
2. Educational advantages, in public and privately managed schools of all grades and classes
3. Industrial and vocational training, the emphasis being placed on industrial practice as discipline
4. Health and sanitary measures; preventive methods and educational health practices being first
5. Home life and housing, with the emphasis on convenience and comfort for family rearing
6. Community morals and social direction, especially as to community advantages for children of high school age
7. Encouragement of religious training, considering status and advantages without reference to sect or creed
8. Coordinated efforts of workers, especially those representing home, school, church and community
9. Publicity and propaganda, through press, bill-boards, circulars and public addresses
10. Organization and methods used in the accomplishment of the local work of the campaign

In the main, the acting committees will be asked to make a showing, first, of the physical equipment and the visible situations; second, the brief verbal report of heads of departments of the work; third, the preserved and prepared written and printed account of the local undertaking.

Child Health Demonstration in the Far West

ANNOUNCEMENT has been made that the fourth in the series of five-year child health demonstrations now being conducted by the Child Health Demonstration Committee, associated with the American Child Health Association for supervision of the Commonwealth Fund Program, will be awarded to some city or county in the far West. The city or county must be between 20,000 and 75,000 population and be located in one

of the following states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington or Wyoming.

Aside from size and locality, the choice of the community will be based upon a review of the health situation and the needs of the community and the sincerity of the community's desire to develop a complete and rounded plan for a child health demonstration.



CONSTRUCTION UNDER WAY IN KAPUSKASING

a large area of the surrounding land. The site selected has an elevation sufficient to meet all requirements, and when the river-level is raised will have the advantage of being almost entirely surrounded by water.

The area set aside for the municipality covers 2,053 acres, of which a comparatively small part, 220.8 acres, has been subdivided and laid out as a town site. This site, in addition to a large portion of the other land included within the limits of the municipality, is owned by the Province. A number of lots have been reserved for the Company, some have been set aside for the Housing Commission it is proposed to establish, and the remaining lots have been placed on the open market. The subdivision made will accommodate about 2,500 inhabitants, and further subdivisions will be made as the population increases. In leaving the large area of unsubdivided land surrounding the town site, the town planners aimed to prevent the erection of houses of an undesirable character in the immediate vicinity of the town, and also to assure the municipality of control of the development of land, business and health conditions in this surrounding territory.

In the general town plan, a street system has been developed which adequately provides for the present needs, and which can also be easily extended or linked up with new streets opened at a later date either inside or beyond the municipal limits. A main business area has been reserved for the erection of business structures of a permanent character, and a secondary business area has been set aside for the erection of buildings of a temporary char-

acter, immediately required by the new town. Appropriate locations have also been provided for municipal buildings, schools, churches, hospitals, etc. The lands along the river-front surrounding the town, being somewhat too low for building purposes, have been reserved almost entirely for park and recreational areas.

During the past year building construction in Kapuskasing has made rapid progress. Ninety-four houses have been completed, with sewerage and water services installed and connected. A public school, hospital, community hall, a new railway station and one unit of a good hotel are some of the other structures that have now reached completion.

While Kapuskasing is not what is known as a "company" town, the water-supply for the community is being obtained at cost from the Company's plant, thus eliminating the expense of operating an independent pumping-station. The distribution system has been so designed as to take care of modern fire protection requirements, and hydrants have been placed at convenient points. Sewers and a sewage disposal system of sufficient capacity to take care of the needs of the anticipated population of the town for several years to come have been installed, and as both the sewerage and the water-works system are being built in units, they can be gradually extended to meet future needs.

This town planning project has been carried out entirely under the direction of the Bureau of Municipal Affairs of Ontario, and all surveys and plans have been handled solely by officials of the Ontario Government.

A PLEA FOR MOTION PICTURES IN THE SCHOOLS AT NIGHT

There is no more senseless extravagance than great masses of costly school masonry dead, inert, useless, night after night, when they might be throbbing with life and light while the community, through visual representation, received an educational and spiritual uplift.—SUSAN M. DORSEY, *Superintendent of Schools, Los Angeles.*

Chamber of Commerce Activities in Public Affairs

Zoning Legislation Secured for South Carolina

CHARLESTON, S. C.—A recent worth-while accomplishment of the Charleston Chamber of Commerce has been the passage by the South Carolina Legislature of a zoning enabling act. This act was signed by Governor McLeod on March 22.

Last July an intensive study of zoning was undertaken by the Chamber of Commerce, following which the importance of this method of regulating the future growth of cities was called to the attention of all chambers of commerce in South Carolina. A number of speeches on the subject were made in different parts of the state by the Manager of the Charleston Chamber and by Dr. R. S. MacElwee, Commissioner of Foreign Trade and Port Development.

As a result of the study of the problem, it was decided to submit to the Legislature for adoption the Zoning Enabling Act which had been prepared by the Advisory Committee on Zoning, appointed by Secretary Hoover of the United States Department of Commerce. This act was strongly supported by other chambers of commerce throughout the state and was passed by the House and the Senate without material opposition.

In connection with this work the Chamber of Commerce brought to Charleston Hon. Edward M. Bassett, Counsel for the Zoning Committee of New York City, who addressed a large joint meeting of the Chamber of Commerce and the Rotary, Kiwanis, Lions and Exchange Clubs, and explained the application of zoning to the city.

Now that the proposed act has become a law, immediate steps will be taken by the Chamber of Commerce for the appointment of a committee to study carefully the local situation and recommend to the City Council what, in their opinion, would constitute a practical and adequate ordinance for Charleston, so that we may intelligently control the future industrial growth of the city, protect the homes of property owners from damage, and increase the value of such property as may be used for business purposes. As Mr. Bassett

pointed out in his address, proper zoning regulations tend to increase all property values throughout the city and make them permanent.

MEIGS B. RUSSELL,
Manager, Charleston Chamber of Commerce.

A State-wide Campaign for Adequate Public Health Work

NASHVILLE, TENN.—Chambers of commerce throughout the state of Tennessee are now conducting a campaign for an increased appropriation by the next Legislature to the State Board of Health, which will enable this important department to function in the proper manner and raise the standing of Tennessee in public health work. Civic clubs, farm bureaus and the medical profession are also aiding in the campaign.

The question of the small appropriation made by the Legislature each year for public health work came up for discussion at a meeting of representatives from all the chambers of commerce of Tennessee held at Nashville on October 9 last. Unanimous approval of the proposed campaign was voted, and the Nashville Chamber of Commerce was asked to take the lead. The state was divided into four sections, the Nashville Chamber taking the middle counties, the Memphis Chamber the west counties, the Chattanooga Chamber the lower east counties, and the Knoxville Chamber the upper east section.

Sectional meetings were first held in each of the four cities mentioned. Prominent business men, physicians, and members of the chambers of commerce and civic clubs were invited to attend. The proposition was placed before them both by lay speakers and by medical men; the plan of campaign was announced to them, and in each division instant approval was given.

Each of the four chambers named agreed to take the message to the counties in its section. They selected both laymen and medical men to speak in each county-seat. In turn, each county chamber of commerce—or, where there is no chamber of commerce, some civic organization—undertakes to carry the message to the people of each village and hamlet in that county, so that the entire state will be

completely covered when the campaign is through.

The need for more attention to public health is explained to the voters, and they are asked to see that men are sent to the Legislature next year pledged to make an adequate appropriation to the State Board of Health. The state at this time is spending over twenty times as much for the care and cure of unfortunates confined in its eleemosynary institutions—25 per cent of whom are there from the effects of preventable diseases—as it is appropriating for prevention through the State Health Department. An increased appropriation for preventive work would ultimately make possible a substantial decrease in appropriations for care and cure.

The newspapers of the state have given liberal space to the campaign. Weeklies and dailies are running stories sent out by the Nashville Chamber of Commerce, these stories being prepared by prominent laymen and medical men who are interested in public health. The co-operation being rendered by members of the medical profession in the whole campaign has been most gratifying.

Child Health Day

ST. PAUL, MINN.—Child Health Day was celebrated for the third year on March 28, in the St. Paul Auditorium, with an all-day program on which appeared such authorities as Angelo Patri of New York, Dr. Caroline Hedger of the Elizabeth McCormick Memorial Fund, Chicago, and Dr. Edith Hale Swift of Johns Hopkins University.

Child Health Day was sponsored by the General Federation of Mothers' Clubs and the St. Paul Association with the cooperation of many other social and civic organizations. Posters and placards bearing the slogan "It's Great to Be Healthy," with the picture of a boy running with a kite, were widely distributed. Thousands of persons heard the program in the Auditorium.

St. Paul has led the nation in the observance

of Child Health Day. Since our first program many municipalities have written to us for information and have launched similar undertakings. Within the past month President Coolidge has issued his proclamation setting aside May 1 as National Child Health Day. The President declares that the purpose of the day is "to focus the thought of the country on constructive measures for improving and safeguarding the health of the nation's children." The American Child Health Association is now asking the cities of the United States to observe the day in accordance with the President's request.

St. Paul is convinced that Child Health Day is a great civic asset. As Mayor Arthur E. Nelson said in his proclamation for the day: "We are all anxious to see St. Paul prosper and grow, but in our desire to improve our environment and conditions we must not neglect the lives of the children who in a few years will be sharing the civic responsibilities with us."

The St. Paul Association will be glad to give detailed information on the day to any who apply.

S. A. BOWING,
Associate Secretary, St. Paul
Community Chest.

**It's GREAT to be
HEALTHY**



**AUDITORIUM
MARCH 28**

**Third Annual
CHILD HEALTH DAY**

A Study of Local Housing Conditions

KLAMATH FALLS, ORE.—A growing housing shortage in Klamath Falls has resulted from the construction work on the "Lakes Route," now under way by the Southern Pacific Company. This new line, which will result in a more direct route than heretofore between Portland and San Francisco, is the greatest piece of railroad construction now under way in the United States, tapping a great timber and agricultural area.

Klamath Falls, a city of some 7,500 people, through which the Lakes Route will pass, has been growing so rapidly that families were forced to live in storerooms and tents. The housing situation, therefore, became an important problem for the Klamath County Chamber of Commerce. As a first step it was evident that definite facts were needed as a



DESIGNS WINNING FIRST PRIZE (IN CENTER), SECOND PRIZE AND HONORABLE MENTION
IN NEWARK COMPETITION FOR TRAFFIC TOWERS

basis for action, in place of a merely "general knowledge" of a housing shortage.

A Home Building Committee of influential men was appointed. This committee called into conference various other groups, and for the purpose of the survey divided the city into ten precincts. For each precinct a captain was appointed, who in turn appointed ten men from his district. Blanks were prepared, one for each family, and a house-to-house canvass was made.

As a result of this survey, the committee is able to proceed intelligently with its development plans. The questionnaires show not only the number of persons occupying each of the existing houses, but also the important fact that 339 persons signified their desire to purchase homes on an installment basis, while 188 others stated that they are able to build or finance new houses to rent or sell.

LYNN P. SABIN,

Executive Secretary, Klamath County Chamber of Commerce.

Competitive Designs for Traffic Towers

NEWARK, N. J.—At the first annual meeting of the Broad Street Association, in March, 1923, the Traffic Committee brought in an exhaustive report which was adopted by the Association. It included a dozen or more suggestions to the City Commissioners for the improvement of traffic on Broad Street

Among these was the suggestion that a traffic-control lighting system should be established which would unify the flow of traffic through the business center of the city.

This suggestion met with the approval of Commissioner Brennan, Director of Public Safety, and through his efforts provision was made for this in the tax budget of 1924.

Since this meeting last year, members of the Traffic Committee and of the Newark Police Department have been studying systems in use in other cities throughout the United States. They found several satisfactory systems in use, but in no city did they see a traffic signal post which they thought suitable for Newark. The Traffic Committee therefore called to its assistance the Committee on Architectural Harmony of the Association, and these two committees laid the matter before the New Jersey Society of Architects.

With the approval of Director Brennan, a competition for the design of a standard for traffic regulation, open to the architects of Newark, was held, under the auspices of the Society of Architects, prizes being offered by the Broad Street Association for the best two designs submitted. From the work of a large number of architects five designs were selected, any one of which would be an ornament to the street. The first prize was awarded to Nathan Harris and the second prize to George W. Backoff and W. Pierr

Aquin. The award took place at the monthly meeting of the New Jersey Society of Architects, on April 10, 1924, the presentation being made by the retiring president of the Broad Street Association.

OGDEN H. BOWERS,
Executive Manager, Broad Street Association.

University of Illinois Training Senior Students for Chamber of Commerce Secretariats

Eighteen seniors at the University of Illinois are taking advantage of an opportunity, made available in February, to secure special training for the career of chamber of commerce secretary. This new course—offered, it is believed, by no other major American university—is the result of the unusual interest taken in chamber of commerce work by Dr. Charles M. Thompson, Dean of the College of Commerce and Business Administration at Illinois. A special feature of the course is the lectures and conferences each Thursday by active secretaries from various Illinois cities; those cooperating in this way during the present semester including the chamber of commerce secretaries from Springfield, Kankakee, Peoria, Bloomington, Decatur, Danville, Urbana, LaSalle and Joliet, and the general and legislative secretaries of the Illinois Chamber of Commerce.

A statement issued by the Bureau of Business Research of the University, in referring to investigations made by the eighteen members of the class, says:

"These investigations reveal the transition of the average chamber of commerce from a trade organization to a civic association. The class has learned that the present chamber of commerce almost represents the community at work, that it tends to operate as an informal city council, without authority other than moral suasion. A survey of the activities of the chambers of commerce in Illinois indicates

that a composite chamber of commerce in that state performs at least 121 functions in its civic division alone, not to mention many more activities in its traffic, industrial, merchants', and organization (actual operation of the chamber) divisions. The relation of the dinner clubs with the chamber of commerce, the question of community endowment, and intercommunity visitations are among the more recent developments in the work."

Awards in Interchamber Fire Waste Contest

The award to the Chamber of Commerce of Hoboken, N. J., of the grand prize in the Interchamber Fire Waste Contest, conducted by the National Fire Waste Council, has been announced by the Chamber of Commerce of the United States.

The first prize for cities of the first class, over 100,000, was awarded to Indianapolis. For cities of the second class the prize went to Hoboken; for cities of the third class, to Dubuque, Iowa, and for cities of the fourth class, to Blytheville, Ark.

The award is based on fire losses and fire prevention measures. Hoboken showed a reduction in fire loss of 67 per cent for 1923 in comparison with the average for the preceding five years, or a reduction from \$449,224 to \$157,041.

For all of the cities entered in the contest and submitting reports, the fire loss for 1923 was \$3.24, compared with \$4.75 for the whole country in 1922. As a result of the efforts made by the sixteen honor cities, a reduction of 13½ per cent in per capita loss, compared with the preceding five-year average, and a decrease of 34 per cent in the number of persons killed and injured, were accomplished.

Two hundred and two chambers of commerce in forty-three states are entered in the national contest.

Kiwanis Club Presents Automatic Sprinkler System to Hospital

AN interesting example of civic service by a luncheon club is reported from Huntsville, Ala., where the Kiwanis Club has presented to the local hospital a complete automatic sprinkler system. The gift was financed by three annual entertainments, starting with the "Jollies of 1922." In telling of this undertaking in its issue of April, 1924, the *Grinnell Automatic Sprinkler Bulletin* makes the following statement regarding the service of civic organizations:

"The club felt in making this unusual presenta-

tion to the hospital that it was giving the greatest thing it could give—real safety to life for the occupants of the hospital. Those who are unfamiliar with the inner activities and motivating spirit of civic and fraternal organizations are apt to think that such organizations exist primarily to initiate new members, parade, hold lunches and listen to speeches. As a matter of fact, such activities are only superficially apparent. Behind all such organizations there lies a firm, fine foundation of human service."

"Government by Default"---Cause and Cure

By William P. Lovett

Secretary, Detroit Citizens' League

GOVERNMENT is one of the few agencies which touch all the people at many points, for good or ill. Yet one of the greatest weaknesses of all popular government is lack of contact between the government and the people—between the corporation and its stockholders. City government is not only a matter of business, but a matter of people—it must be human in quality or it fails.

It is said that every city is governed as well as it deserves to be. This is true when the people have access to the facts. If they are not interested, they do not care for facts. But many times the people cannot get the facts even if they try, and so they get discouraged and careless about all government. This civic indifference, accounting for the light vote at many elections, is the greatest handicap on good government to-day.

"Government by default" is a good name for this situation. It is the exception rather than the rule in American elections when a majority of the qualified voters cast any ballots at all at a given election. This means government by minorities. The great majority of "good" citizens, not having the facts and being indifferent, permit an alert and frequently corrupt minority, with only selfish interests to serve, to dominate the particular unit of government.

The public should be a party to government transactions before, not after, the decisions are made. Every good city official will want to have the citizens informed. It is only the grafter or professional politician, with selfish ends to serve, who wants the people to be kept in ignorance of city affairs. The great majority of officials are facing a seemingly insoluble problem: how to get the facts to the

people so they will be understood and the people will maintain continuous, intelligent interest in their government. Nobody has yet furnished a final solution to this problem, but many things can be done to help solve it.

The citizen should know the facts because, if he believes they are kept from him, he becomes suspicious and careless, and at election time he is easily stamped by false propa-

ganda. If the city waits till election time, the thing gets too hot, and real facts cannot be imparted so as to be accepted. At elections some of the candidates are likely to be seeking to conceal facts and distort the truth, so as to get votes. Most citizens discount political statements made in election campaigns; they assume personal bias. But since the people, at elections, register decisions on government as to candidates or issues, it is

Shall We Continue to Have Government by Minorities?

For the situation here described, lack of proper methods in reporting government to the people is largely responsible. Until this problem is solved, the whole question of our American democracy will still be left hanging in the balance. The measure of success in good government is largely determined by the measure of citizen interest and civic cooperation. Such interest and cooperation either depend upon, or go together with, adequate methods of reporting government to the people. The man or group of men who can solve this problem will become great in American history.

essential to try to keep the public informed during the whole year.

In making the city budget there are vast fields yet to be cultivated for getting to the public the facts regarding taxes. The average taxpayer knows so little about the whole subject of city financing that he makes no inquiry about the units of service for which the money is spent; he simply kicks on the size of his total tax bill, or throws out a chest and condemns the tax rate, which of course is always, from his standpoint, too high. Public ignorance and unfounded suspicions are the soil in which many a capable administration has allowed seeds of distrust to grow, till they have upset the whole helpful program and ousted good men from public office.

The newspapers cannot alone solve this problem—if they can, they have not yet done

THE AMERICAN CITY

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It will pay every City, County and Park Board Official and Contractor to get the facts about the all-round economies of “Caterpillar” Tractors. For “Caterpillars” have the power and endurance to operate every kind of grading and road maintenance equipment with highest possible efficiency. They speed up every phase of street and road making and park maintenance. They reduce the cost of dirt moving, leveling, hauling and snow removal work. Taxpayers are depending upon their public officials

for the most careful and economical expenditure of road and park funds. The “Caterpillar” has everywhere proved to be the soundest investment any City, County, Township or Park Board can make. There is a “Caterpillar” of size and capacity to fit in with every public works program. At your request we will gladly send you real facts about “Caterpillar” Performance in every class of tractive work demanding power, endurance and economy.

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it. Newspapers exist chiefly to print news, or what the editors think the people want to read, and many facts in the city hall are not news in that sense. Or, the information is furnished by the press, not logically, connectedly, and continuously, but piecemeal, so the citizen is confused and largely in ignorance. To some extent newspapers, though recognized as an unofficial branch of the government, are in danger of suffering from their own bias in opinion, or the reader attributes bias to them. The press also is subject to laws against libel, if it prints all it knows.

Another handicap is the fact that people think and talk, not of government in the true sense, but of politics in the bad sense, and thus they do not expect the truth. They assume that any man in public office may be a crook, hence cannot give the facts—he is only a “politician.” Now this is a bad situation, because the man on the job, at the head of a city department, ought to know the facts, and ought to be accepted as the authority in that line.

Many other methods have been suggested and used, in various cities, including departmental reports, which generally are so technical, statistical, or otherwise unreadable, that they are not read at all by the average taxpayer. Yet bulletins and municipal reports are essential to reporting government. Another excellent method is that of municipal exhibits.

Why Not an “Information Official”?

Experience shows that while no single method of reporting government can alone solve the problem in every case, a combination of methods can best be used, with emphasis locally on that method which best

fits the case. Municipal publicity may well be delegated to a specialist in every city, who makes of it a study and a practice.

Such an information official should be qualified and authorized to organize his work, call on city officials for articles, reports, addresses, etc., and send speakers where they may be needed to tell the people what they want to know. He should get out interesting, attractive, illustrated leaflets, reports, folders, etc., and make use of every available channel of publicity, including motion pictures and municipal exhibits.

Special attention should be given to the use of the press. In some cases possibly a single newspaper can be persuaded to set up and maintain a department of municipal information, highly organized, and constituting an advantage to the city and to that newspaper. The motion picture already has been used effectively, with slides for the stereopticon, in connection with all sorts of municipal projects.

I believe the best principle to adopt is to take the government to the people rather than ask the people to go to the city hall. Utilize meetings already arranged, where citizens gather. Make use of the public schools, churches, clubs, and even the pulpit and platform for municipal information. Great results have been achieved through civic clubs, the research bureau method, both private and public, and the speakers' bureau. By adapting all these to local conditions, the handicap of public ignorance by slow degrees, over periods of years, can be overcome, and the effectiveness and success of city government can be doubled.

ACKNOWLEDGMENT.—A summary furnished to THE AMERICAN CITY by the author, based on an extended address recently given by him before the Illinois Municipal League.

West Virginia Joins List of States Having Municipal Leagues

By the organization of the West Virginia Municipal League, another state has been added to the growing list of states whose municipalities are organized for mutual aid in promoting better city government and community welfare.

The organization meeting of the West Virginia League, held in Clarksburg March 20, resulted in the election of the following officers to serve for the first year: Harrison G. Otis, City Manager of Clarksburg, President; W. T. McCreery, Mayor of Wellsburg, first Vice-President; Herbert Stansbury, Mayor of Beckley, second Vice-President; John L. Ryan, Mayor of Fayetteville, third Vice-

President, and Dr. David Littlejohn, City Health Officer of Bluefield, additional member of the directorate to serve for one year until a past president is available to complete the membership of the board.

The annual dues for member cities and towns will range from \$10 for places of less than 1,000 population to \$100 for cities of more than 30,000 population. The League Secretariat and Bureau of Municipal Research and Information will be established at the State University at Morgantown under the supervision of Nat T. Frame, chairman of the University Extension Committee, who has been named Executive Secretary.

Autocar short wheelbase handiness speeds up rubbish collections



4-cylinder 4 to 6 ton Autocar, trash body, owned by the City of Philadelphia

PRACTICALLY every city department of Philadelphia is saving expenses with Autocars. The Street Cleaning Division for making curb collections of ashes and rubbish; the Bureau of Highways in street and bridge repair; the Electrical Bureau for overhead and underground construction; the Bureau of Health and Hospitals for transporting supplies; the Bureau of Water for construction and repair work; the County Prison, the Board of Education, the Free Library, and the House of Correction

for miscellaneous hauling.

This impressive fleet of Autocars, bought over a period of 13 years, offers a convincing proof that Autocars, because of their short wheelbase handiness and economy of operation, are the most efficient trucks for municipal service.

Furthermore, each Autocar is assured more continuous operation by the expert servicing facilities of the nation-wide system of Autocar Direct Factory Branches.

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Hints, Helps and Happenings

Proposed Standard Smoke Ordinance

ATENTATIVE draft of a Standard Smoke Abatement Ordinance has been prepared by a joint committee made up of representatives of the American Society of Heating and Ventilating Engineers, the Stoker Manufacturers' Association, the American Civic Association, and the Fuels Division of the American Society of Mechanical Engineers.

The ordinance regulates the emission of smoke from any chimney, smoke-stack or other source within the corporate limits of the city, creates a Bureau of Smoke Regulation and prescribes penalties for the violation of provisions of the ordinance. To quote in part:

Section 3. The production or emission within the city of smoke, the density or shade of which is equal to or greater than number three (3) of the Ringlemann Chart, from any stack, except that of a locomotive or steamboat, for a period or for periods aggregating two (2) minutes or more in any period of fifteen (15) minutes, and the emission of such smoke from any locomotive or steamboat for a period or for periods aggregating one (1) minute or more in any period of eight (8) minutes, is hereby prohibited.

Section 5. It shall be unlawful for any engineer, contractor, or other person or corporation to do the work of constructing, installing, reconstructing, altering or repairing any furnace, boiler furnace, stack or other apparatus connected with stack, unless the person or corporation for whom such construction, installation, reconstruction, alteration or repair is being made has proper authority, in the form of a permit from the Bureau of Smoke Regulation for such work.

Section 10 (a). Each power boiler with more than 1,500 square feet of heating surface, using coal as fuel, shall be provided with a mechanical stoker or other device or attachment approved by the Bureau of Smoke Regulation.

Section 10 contains 26 paragraphs specifying kinds and sizes of boilers, furnaces, stacks and other equipment, and methods of installation required.

The complete ordinance appears in the May issue of *Mechanical Engineering*, published by the American Society of Mechanical Engineers, 29 West 39th Street, New York. The committee which drafted the ordinance is desirous of obtaining helpful criticisms and suggestions. These should be mailed to the Chairman, Dr. O. P. Hood, Bureau of Mines, Washington, D. C.

Tax-exempt Securities Favored by Organized Labor

THAT organized labor is not worrying about the alleged injustice of allowing persons of wealth to escape taxation by investments in tax-exempt securities, was made clear on April 15 in an address by Peter J. Brady, President of the Federation Bank of New York, a member of the Federal Reserve System. Speaking before the Academy of Political Science, as Chairman of the Committee on Banking and Education of the New York State Federation of Labor, Mr. Brady said, in part:

"Labor's plan of taxation when it becomes definitely formulated will be as constructive as its economic policy, which is based upon the gradual raising of the standard of living of the American wage-earners. Trade unionists observe with great

satisfaction our present sound economic condition, our wholesome retail trade and the abundance of savings available for reinvestment in industry and commerce as the best vindication of their traditional belief that fair wages and a high living standard are the foundation of our national well-being.

"Labor is better off than ever before, in spite of the tax rate and a war debt twenty times greater than the national debt previous to 1914. Wages measured by the commodities that can be bought are at the peak both for skilled and unskilled labor, with the exception of certain unorganized industries employing women and children, and the 'white collar group' of teachers, clergymen, office and technical workers.

"Secretary Mellon has declared that much wealth has evaded the surtax by being invested in tax-exempt securities. If that is the direction wealth is taking flight to, let it, for such investments are for the common good. It has been suggested that it is quite impossible for wealth to monopolize these securities and that fully three billion dollars of the available eleven billion of such bonds are held by small property owners. Among the corporations holding such securities are banks, including labor banks representing the cooperative ownership of many persons of small means. Rather than to restrict, we welcome the expansion of this form of investment and the necessary construction of public schools, hospitals, state roads, canals, water and electric power works, and similar enterprises for the common good."

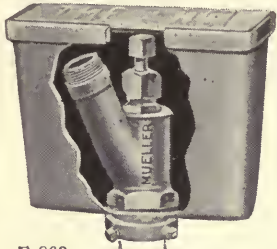
Progress in Removal of Objectionable Bill-Boards

IN conformity with its pledge* to the National Committee for Restriction of Outdoor Advertising, the Standard Oil Company of New York has begun the removal of its advertising signs where they mar or obstruct natural scenic beauties. The following statement by the company's president, Herbert L. Pratt, was read at a meeting of the National Committee last month by the committee's chairman, Mrs. W. L. Lawton, of Glens Falls, N. Y.

"As an example of the procedure we intend to follow, I will cite the first instance which has just been completed. Some ten days ago I received a note from the Secretary of the Chamber of Commerce of Great Barrington, Mass., telling me of having read in the newspapers of what we proposed to do with objectionable sign-boards. He said there was one of our boards on the main highway between Great Barrington and Stockbridge which was obstructing a beautiful view of the scenery and was the only bill-board of its kind in that location.

"On receipt of his letter I immediately had one of our representatives, with a representative of the Thomas Cusack Company, from which we rent the board and which is showing a ready willingness to help us in this matter, call on the

* See THE AMERICAN CITY for April, 1924, page 433.



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This Mueller device takes the place of the old style, sloppy hydrant. No. E-862 is designed for outdoor use, and has the valve sunk below the frost line, thus making special packing to prevent freezing unnecessary. No. E-863 is designed for use indoors, or in southern latitudes, where there is no danger from frost, and it is consequently made without a stop and waste device.

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closes flush with the ground or floor, which does away with the unsightly goose neck, as well as eliminating the obstruction to lawn mower or truck. The construction provides for the disposal of water through the bottom of the box, thus minimizing the possibility of freezing, due to the formation of puddles.

The Mueller representatives at the A.W.W.A. Convention at the Hotel Astor, New York, May 19-24, will be glad to give you details and to quote you prices.

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Chamber of Commerce and say that the board would be moved and placed in any location which the Chamber itself might select.

"Again, by the same mail I received a letter from the Chamber of Commerce of Lawrence, Mass., saying that if we would send them the designs our architects were preparing to replace the unsightly signs displayed on the 'hot dog' and soft drink booth along the highways, they would be glad to distribute these among those persons who were selling such commodities along their roadsides, in the effort to improve the general

appearance of their highways. It is our purpose to send these as soon as they are prepared.

"Whenever possible, we will have our signs which are objectionable or which mar the scenic beauty of the country removed before our contracts expire."

Among the large advertisers who are reported to have endorsed the movement recently are the Gulf Refining Company, Dodge Brothers, the Ajax Rubber Company, the Hood Rubber Company, the Ward Baking Company, the Texas Company and the Fleischmann Company.

A Tribute to the Late Nelson P. Lewis

To the Editor of THE AMERICAN CITY:

To many of the readers of THE AMERICAN CITY the announcement of the death of Nelson P. Lewis will come as a shock and will be received with a sense of personal loss, for he was known from the Atlantic to the Pacific. Many of those who did not know him personally are familiar with his writings.

There are few engineers who have rendered such long and distinguished service to the cause of city planning as Nelson P. Lewis. For about thirty years he was connected with the government of the city of New York, first in the city of Brooklyn before the consolidation of Brooklyn and New York, and later as Chief Engineer of the Board of Estimate and Apportionment of the Greater City. Much of the physical development of the city is due to his planning or to his counsel and advice. Mr. Lewis was not only a good engineer; he was a student and a traveler and an artist. He knew the best work of the past in Europe and America and he kept pace with the best work of the present. He was a good teacher. No one could hear him lecture and hear his comments on the pictures that he showed without being informed and charmed. He had powers of persuasion so that one naturally wished to accept his view.

There are men in this world who have ample knowledge and excellent judgment, but who are almost wasted because no one wants to agree with them. Lewis was of just the opposite type. He had the judgment and he had the knowledge, and he could make all his judgment and knowledge effective. There are not many men who serve the city of New York for a great many years in important place, and the fact that they do so serve is of itself a testimonial to their fine qualities of head and heart both.

Mr. Lewis made a contribution to city planning by the publication in 1916 of his book entitled "The Planning of the Modern City."

This was the first American book on city planning written by an engineer for engineers. While Mr. Lewis may have had engineers in mind first, this book has been very useful to the architects and landscape architects from whose ranks most of the other books on city planning have come. It appeals also to laymen who are interested in city planning and who want instruction concerning what city planning has done, what it is, and what it ought to do. In his chapter on the opportunities and responsibilities of the municipal engineer, Mr. Lewis said:

"The engineer as the first man on the ground has a rare opportunity and a grave responsibility. The task calls for vision and imagination, and these are qualities the exercise of which on the part of the engineer has often been thought rather dangerous; and yet the engineer lays the foundation on which our cities are built. He has been too prone to regard his preliminary work as a mere matter of surveying; more or less precise surveying, it may be, but he has been more intent upon the accuracy of his measurements of lines and angles and of his computations of areas than upon the larger problems of providing for the orderly and sightly development of the city."

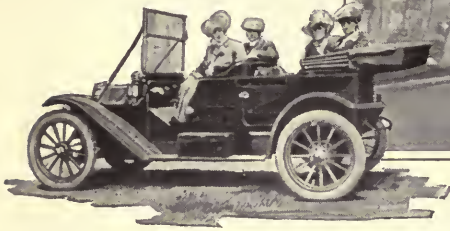
Mr. Lewis had the vision and he was capable of imparting it to others.

When Mr. Lewis retired from the service of the city he became the Director of the Engineering Division of the Committee on Regional Plan of New York and Its Environs. The committee is dealing with a territory of about five thousand square miles situated in three states. Mr. Lewis had traveled this area back and forth and knew it as probably no other one man knew it. He knew its topography, he knew what man had done to it, and he knew the kind of people who lived in it. He was welcome in every one of the towns and villages. He cannot be replaced. There is no other Lewis, but the work will go on, and go on all the better because its foundation was laid as it was.

LAWSON PURDY.

New York, April 16, 1924.

East Broad Street, Westfield, N. J. Tarvia-built 1911. Still in excellent condition after 13 years of service.



This car—long since scrapped! This street—still in perfect condition!

OIL lamps! Braced wind-shield! Open front seat—top neatly folded back so that one got plenty of dust! Can you resist a reminiscent smile at the car of our picture?

That was a smart car as it chugged down East Broad Street in Westfield, N. J., thirteen years ago. But time brings many changes. That car is junk long since.

But not East Broad Street. Unaffected by thirteen years of grinding traffic—it is still in perfect condition, a thoroughly satisfactory street today.

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maintenance is needed to make a Tarvia pavement last indefinitely. Now add these points:

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Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources
For further information, Mr. Williams may be addressed in care of
THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Recent Zoning Ordinances and Enabling Acts

NEW JERSEY.—Enabling act for municipalities, March, 1924

NEW YORK.—East Rockaway, ordinance, January 10, 1924

SOUTH CAROLINA.—General enabling act, March, 1924

Recent Zoning Decisions

CALIFORNIA.—*Miller v. Board of Public Works of City of Los Angeles*. The decision of this case in the District Court of Appeals was noted in our March "Notes." A hearing has been granted in the case by the Supreme Court of the state.

NEW YORK.—*Matter of Heppe*, Supreme Court, Special Term, Part I; reported in *New York Law Journal*, March 14, page 2138. Under the New York City law the petitioner, after application to the Fire Commissioner for a permit, and refusal by him to grant it, has no recourse but appeal to the Board of Standards and Appeals. Mandamus will not lie.

Municipal Gas Co. v. Nolan, Superintendent of Bureau of Buildings, City of Albany. The decision in this case, mentioned in our March "Notes," has been unanimously affirmed in the Appellate Division.

People ex rel. Bruckner v. Walsh et al., Supreme Court, Special Term, Part I, reported in *New York Law Journal*, March 14, 1924, p. 2138. Under the zoning regulations for New York City the Board of Appeals may "permit in a business district the erection or extension of a garage . . . in any portion of a street between two intersecting streets in which portion there exists a garage for more than five motor vehicles . . . at the time of the passage of this resolution." Held that a garage for which a permit had been issued prior to the passage of the zoning resolution, and which was erected, pursuant thereto, after its passage, was an existing garage within the meaning of the portion of the zoning resolution in question.

People ex rel. Neinstein v. Walsh, in accord.

City of Utica v. Hanna, 202 App. Div. 610; affirmed without opinion, 237 N. Y. 26. There is no longer question about the power of the Legislature to authorize the adoption of general zoning ordinances in cities; but under the empowering act contained in the General City Law a zoning ordinance is invalid and not within the power delegated by subd. 25 of Sec. 20 of that law which applies only to a small part of a single street in a city, nor is such an ordinance adopted "in accord with a well-considered plan" for zoning the city, as required by the law.

A zoning ordinance is invalid which permits the construction of the prohibited buildings with the consent of the property owners fronting on the street within a specified distance of the pro-

posed construction. In this connection the Court says:

"Such exceptions would manifestly be inconsistent with enforcement of any adopted plan which the city was carrying out. The clause allowing such exceptions amounts to a delegation by the municipal authorities to the property owners of the power to exempt themselves from the regulations determined under legislative sanction by the city authorities to be beneficial to the welfare of the city. The property owners within any restricted area are not the persons solely or even principally to be considered. The general welfare of the municipality as a whole must be considered."

Nor is the ordinance to be sustained under Sections 19 or 20 of the General City Law (the so-called "Home Rule Act" of 1913).

PENNSYLVANIA.—In re permit to American Reduction Co., Court of Common Pleas, Allegheny County, January Term, 1924. Appeal from a decision of the Board of Appeals of Pittsburgh directing the Superintendent of Building Inspection to issue a permit to the American Reduction Company to erect and operate an incinerating plant in a light industrial district. The law gives the Board the power to vary the ordinance in harmony with its general purpose and in accordance with rules therein contained. The ordinance authorizes the erection of an incinerating plant in a light industrial district only with the permission of the Board of Appeals.

Held that (1) the zoning law and ordinance are constitutional; (2) the provision of the law giving the Board of Appeals power to vary the ordinance is valid. It is not a delegation of legislative power, but a provision with regard to the power of an administrative body, which is to ascertain facts and apply them to certain requirements; (3) the decision of the board granting its permit with suitable conditions is, under the circumstances of this case, a reasonable one. The decision of the Board allowing the erection of the plant in the light industrial district is therefore sustained. If the plant, notwithstanding the regulations imposed by the Board, becomes a nuisance, those affected may always apply for appropriate relief.

The New Zoning Law for New Jersey.—The enactment of the new zoning Law for New Jersey, applicable to all the municipalities of the state, is a zoning event of importance. Previous to the passage of this law the zoning enabling statutes of New Jersey were numerous and, to say the least, confusing. In the opinion of many students of the subject, these laws were also, in many important respects, defective. The new law is in general conformity to the model law of the Department of Commerce, Washington, D. C.

Report on Zoning in Cincinnati.—The United



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It will pay YOU to investigate the advantages of Best Tractors. Send for a list of nearby owners and let their testimony—man to man—convince you.

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BEST TRACTORS

City Planning Committee of Cincinnati on January 24 issued to the City Council an excellent 60-page pamphlet consisting of a "Statement and Evidence Submitted on Pending Zoning Ordinances"; explaining the ordinances from the many points of view from which they should be considered, and giving statements of opinions from experts on city life and growth. The pamphlet ends with a statement by Alfred Bettman on the constitutionality of zoning, which is especially timely and helpful.

Conference on Zoning as Affecting Telephone Companies.—The Association of City Planning Commissions of Cities of the Third Class in Pennsylvania has issued a report of the conference of zoning commissioners, city planning commissioners and municipal officials held at the invitation of The Bell Telephone Company of Pennsylvania at Philadelphia on December 14, 1923. This bulletin may be obtained from Leo J. Buettner, Secretary of the Association, Johnstown, Pa.

The Municipal Bond Market

By **Sanders Shanks, Jr.**

Editor, *The Bond Buyer*

Governor Smith Helps Southern Cities

THE adoption of the "Southern cities" savings bank investment amendment by the New York Legislature has removed a long-standing injustice in the municipal bond market. The New York law has always excluded as savings bank and trust fund investments bonds of cities located in states which since 1861 have defaulted upon the state debt. As most of the Southern States defaulted temporarily during the Civil War on bonds held in the North, this provision has stood as a bar against the bonds of some of the best cities in the South, including Richmond, which, we believe, has never in its history defaulted or delayed the payment of its own debt. This sectional discrimination has always grated on the sensibilities of the South and has also very materially affected the market price and amount realized by the cities in selling their bonds. It is of interest to all city officials to know that the eligibility of their bonds as investments for New York savings banks has an effect on their credit which is roughly estimated at 1/10 per cent in the net interest rate paid on their bonds. On \$1,000,000 bonds of an average maturity of fifteen years, this means about \$10,000. In other words, the Southern cities have for many years lost at least \$10 a thousand on their bonds because of the discrimination in the New York law.

Former efforts to remove this discrimination have been unavailing, a bill for this purpose initiated by the Tennessee cities having failed in 1923. The present successful effort originated with the city of Richmond. It was made by the city's bond counsel, Reed, Dougherty & Hoyt, and was successful because of the active interest and support of Governor Smith. The city secured the interest of Governor Trinkle of Virginia and of other

state and city officials of the South and members of Congress, including ex-Governor Montague of Virginia and Cordell Hull of Tennessee. Governor Smith not only responded generously to this appeal, but he grasped its larger aspects and insisted on removing an unfriendly discrimination against sister states based, as it was in most instances, on the fact of their secession during the Civil War. It is gratifying to know that at last that war is over so far as the credit of the Southern cities is concerned.

An Important Bond Sale

The largest and most interesting bond sale of the year was the New York State \$45,000,000 Soldiers' Bonus sold last month. The bonds bear interest at the rate of 4¼ per cent and were sold for a premium of \$659,565, making the net interest cost to the state 4.09 per cent. The premium received by the state will be sufficient to cover the cost of the distribution of the bonus. The bidding for the issue was very keen, five banking syndicates having submitted competitive bids. A few days after the bonds had been awarded, the successful syndicate announced that the entire issue had been resold at prices to yield the investor 4 per cent.

The close bidding for this issue and other large issues listed below, indicates that bond dealers are optimistic about the future:

IMPORTANT STATE AND MUNICIPAL BONDS SOLD IN APRIL

Amount	Municipality	Maturity	Coupon Rate (%)	Net Yield (%)
\$45,000,000	New York State.....	1925-44	4¼	4.09
3,300,000	Kansas City, Mo.....	1942	4½	4.37
5,000,000	St. Louis, Mo.....	1929-44	4½	4.37
3,299,000	Hudson County, N. J.....	1925-72	4½	4.48
5,000,000	Chicago, Sanitary District, Ill.	1926-44	4	4.50
1,511,500	Passaic, N. J.....	1925-64	4¾	4.52
2,285,000	Hawaii	1954 opt. 1944	4½	4.56
1,000,000	New Orleans, La.....	1926-35	4½	4.90



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*"We cannot speak too highly of the Warford Transmission,
for we feel that it is really the making of the Ford Truck."*

*John C. McCusick,
McCusick Contracting Co., Minneapolis*

Warford, the selective type transmission for Ford Cars and Trucks, proved in the gruelling test of road building, has made the Ford Truck the favorite of highway contractors throughout the country.

Conspicuous service at road building, the toughest job of them all, is being given by Warford equipped Fords over the breathtaking grades of Colorado, the plains of Iowa and in the fickle climate of Michigan where the contractor gambles with the weather. The speed that Warford gives the Ford insures his profit.

Letters from the Michigan camps, in the very heart of the automotive industry where the newest wrinkles in car and truck engineering are

brought forth and tested, are unanimous in praise of the added pulling power, added speed and greater economy of operation and maintenance that the Warford Transmission has given the Ford Truck. These letters stand confirmed by repeat orders.

With Warford, the Ford Truck pulls a full two tons through the roughest going. It won't stall in the subgrade. It is guaranteed to pull this double load wherever there is traction. On hard roads Warford makes your Ford a speed truck.

Warford gives you this double duty unit at one third the cost of any other two-ton or speed truck. Ask your Ford dealer or write us.

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The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Restriction by City Government on Freedom of Speech

“THE right of free speech and right of assembly are not absolute, and under the ordinance the mayor had the power, and it was his duty to withhold permits for street meetings when he thought that such meetings would interfere with travel or create disorder. . . . But the people are not to be lawfully deprived of their free customs and privileges by the mere will of the magistrate. Street speaking is not forbidden to all, but only to those who have not received permission from the mayor. The presumption is that all discretionary power will not be arbitrarily exercised, but when it is so exercised the Supreme Court of the United States has not hesitated to hold that it will protect the individuals thus oppressed.” This statement made by Mr. Justice Pound of the New York Court of Appeals in his dissenting opinion in the case of *People vs. Atwell*, 133 *Northeastern Reporter*, 364, fairly expresses a judicial view which has been frequently expressed.

In the cited case, the majority opinion sustained a conviction of violating an ordinance of the city of Mt. Vernon, forbidding “the holding of public meetings upon the public streets of the city,” etc., “without special permit of the mayor, to be granted in writing.” Holding that the ordinance constituted proper exercise of charter power to regulate the use of streets, the opinion said:

“It is not repugnant to the state or Federal Constitution, since it does not abridge the right of free speech or assemblage. Public streets are primarily for public travel. . . . Any obstruction on the streets, whether permanent or temporary, may be declared unlawful.

“It is quite beside the question to assert that the acts forbidden may be lawful in themselves, and could not in a general way be prohibited. On the streets the exercise of such rights is subordinate to the public right of travel and may be regulated or prohibited. Public meetings and assemblages held on the streets tend to obstruct the streets and destroy in a measure the very purpose for which they have been

dedicated. It is too well settled by judicial decisions in both the state and Federal courts that a municipality may pass an ordinance making it unlawful to hold public meetings upon the public streets without a permit therefor to require discussion. . . .

“The people have many constitutional rights, the exercise of which on the public streets may be prohibited.”

Supporting its views, the Court cited similar decisions of the highest courts of Massachusetts, Georgia and Michigan.

In the case of *Duquesne vs. Fincke*, 112 *Atlantic Reporter*, 130, the Pennsylvania Supreme Court sustained the validity of a similar ordinance, observing—in response to a contention that such measures violate the clauses of the Bill of Rights which guarantee to citizens the right of free speech and the right to apply to those invested with the powers of government for redress of grievances, etc.—that the contention overlooked that the clauses do not give one “the right to assemble with others, and to speak wherever he and they choose to go. He would hardly admit that others would have the right so to do in his house without his consent; and doubtless would concede the same to all other citizens. If he wishes to address an assemblage he must gather his audience together in places where he and they have the right to be for this purpose; and the streets are not such places, since they are intended for passage, and not for assemblage.”

In several of the decisions on this subject, including the New York case, the existence of statutory or charter authority for the adoption of such ordinances appears to have been a vital factor in the conclusions reached. And in the case of *Anderson vs. Tedford*, 85 *Southern Reporter*, 673, the Florida Supreme Court decided that an ordinance forbidding street meetings without official permission was void for unreasonableness. The Court remarked:

“This discretion. . . . is uncontrolled by



Detroit United Railway Uses Fords for Track Maintenance

"In the repair and maintenance of our interurban lines running to Flint, Pontiac, Port Huron, Jackson, Toledo and other points, we use six Ford One-Ton Trucks for hauling poles, sand, gravel, ties and wiring supplies," says A. L. Louks, of the motor transportation department, of the D. U. R.

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"When such emergency arises we can depend on our Fords to get men and materials on the job quickly.

"In spite of the severe usage these trucks receive, often being heavily loaded and driven over rough roads, they stand up surprisingly well, requiring very little attention for adjustments or repairs."

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any definite and reasonable terms upon which the permit may be granted. Those officials are empowered to grant or withhold permission . . . without inquiring into the character of persons applying for permit, the purpose of the meeting or assembly, or its effect upon the business, traffic, or peace and quiet of the city; but may, for reasons entirely personal, grant permission to any person and withhold it from another, and as the religious or political proclivities of the head of the city administration change, he may grant permission to a representative of one sect and deny it to another, and withhold permission from a person of one faction and grant it to another of different persuasion. . . .

"The ordinance. . . does not fix and determine the conditions applicable alike to all applicants under which meetings may be lawfully held. . . . Such an ordinance is unreasonable and void."

And in the case of *Bloomington vs. Richardson*, 38 Illinois Appellate Court Reports, 60, one of the intermediate appellate courts of Illinois ruled that an ordinance providing that "no public gathering or meeting of any kind for any purpose. . . . tending to the obstruction thereof, or the gathering of a crowd of people thereon, shall be permitted upon the public streets or public grounds of said city except a written permit therefor be first ob-

tained from the mayor," was unreasonable and void, if interpreted to apply to all meetings or gatherings of any kind or for any purpose upon the streets and other public grounds of the city.

The principal point of conflict in two lines of decisions appears to be this: The majority of the courts, following the view adopted by the New York Court of Appeals, hold that an ordinance of the general character here discussed is not void because discretion is vested in the municipal authorities to determine what meetings shall be permitted and what shall not be. Redress will be granted against an unreasonable and arbitrary exercise of the discretion, but it will not be presumed that there will be such abuse of discretion. The minority view, expressed by the Florida court, is that the ordinance is void if it does not lay down some basis for controlling within reasonable bounds exercise of the official discretion. Offhand, it is difficult, if not impossible, to outline such basis in language appropriate to an ordinance, and our attention has not been drawn to an ordinance in which it has been attempted to define the terms on which permit is to be granted or denied.

Sundry Items of Municipal Law

Power of Cities to Impose Occupational Taxes

Discussion in Toledo of the feasibility of imposing occupational taxes to supply needed revenue draws attention to legal aspects of municipal power to provide for such taxes.

It seems to be generally understood that municipalities do not have inherent power to levy occupation taxes; that cities not operating under home rule charters must look to authority from the Legislature. But the *Toledo City Journal*, in a recent issue, plausibly assumes that "inasmuch as the General Assembly has not limited the authority of the municipality to levy an occupational tax, it would follow . . . that each home rule Ohio municipality has the right to impose an occupational tax."

It is noted, in this connection, that a few years ago the Supreme Court of Ohio said, in upholding the right of the city of Cincinnati to impose taxes of this kind, by reason of its right of local self-government in taxation as well as other matters:

"It is our conclusion, that an ordinance of that character is a valid exercise of its legislative power, and unless and until the state itself invades the field, or expressly interdicts the exercise of the power, the authority of the city of Cincinnati to utilize such subjects of taxation must be upheld."

It is to be inferred, however, from the dis-

cussion in Ohio that it is there regarded that an occupation tax measure can be justified better on a ground of temporary need than as a permanent source of revenue, considering the fact that it creates a burden in addition to general taxes.

Power of City Councils to Vacate Alleys and Streets for Private Benefit

What the Illinois Supreme Court lately observed in the case of *Wolbach vs. Rubens*, 138 Northeastern Reporter, 521, concerning the right of a city to vacate a street or alley appears to be in line with what the courts of other states generally hold on the subject:

"The law is definitely established in this state that cities hold title to the streets and alleys for the use of the local and general public, and in trust for such use, and none other, and they cannot lawfully vacate a street or an alley, or a portion of either, for the benefit and use of a private person or corporation. The authority delegated by law to the cities is to lay out, establish, open, alter, or vacate streets and alleys, and to regulate the use of the same, and in exercising this authority the public interest only must be considered. . . . On the other hand, the courts have no right to inquire into the motives of a legislative body nor into the wisdom or expediency of legislative acts. . . . It is presumed that public officials act

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honestly and patriotically and discharge their duty to the public. . . . Because some private interest may be served by the vacation does not render a vacation ordinance void. Before such an ordinance is void it must clearly appear that no consideration of public interest could have led to its enactment."

Street Lighting as a Public Purpose Supporting General Taxation

Applying provisions of the Utah statutes, the Supreme Court of that state has decided that a city is empowered to light streets by drawing on the general revenues of the city, although the lighting may be limited to a given district. (*Wicks vs. Salt Lake City*, 208 Pacific Reporter, 538.) It is further held that creation of a lighting district, with provision for special assessments to defray the expense, did not preclude the city from establishing a guaranty fund to secure payment of the bonds issued to defray the expense of the improvement. In part, the opinion of the Court reads:

"The assumption of plaintiff that the proposed improvement was not for a public purpose flies in the face of an obvious truth. The primary purpose of lighting a street is to afford comfort, safety, and convenience to those who use the street, without regard to whether or not they own property in the lighted district. This is certainly a public purpose. The enhancement of the value of abutting property is merely incidental to the main purpose."

Building Permit May Be Rescinded Before Being Acted Upon by the Licensee

Under circumstances mentioned in the following excerpt from the opinion of the Iowa Supreme Court in the case of *City of Des Moines vs. Manhattan Oil Co.*, 184 Northwestern Reporter, 823, it was held that a permit to establish a gasoline filling station was subject to revocation:

"We are disposed to hold that the adoption of the resolution to grant the building permit did not have the effect to confer upon the property owner or his lessees a vested right which could not be canceled or recalled, under the circumstances here shown. The lessor had not yet acquired title to the property, and did not acquire it until after the permit had been rescinded. The proposed filling station had not been deposited there. When the application for permit was made, there was then pending and

undisposed of before the council, as the applicant well knew, the petition of the property owners within this area to make it a restricted residence district, and if the Council, having adopted the resolution to grant the permit under such circumstances, concluded it had acted inadvertently or improvidently, or without proper regard for the rights of the petitioners for a restricted district, rescinded the resolution with reasonable promptness, we are of the opinion it did not exceed its authority or abuse its discretion.

City to Avoid Flood Danger May, Without Compensation to Abutting Owners, Make Reasonable Regulations Relative to Building Lines Along a Stream, But Cannot Thereafter Re-locate Line to Detriment of Owners on One Side and in Favor of Owners on the Other

A city, authorized by its charter to make proper regulations for guarding against danger or damage from fire, water, or other element, and to regulate the construction of buildings, may, as a proper exercise of its police power, adopt reasonable restrictions for buildings upon lands along a stream flowing through the city so as to avoid danger from floods. To that end it may adopt an ordinance fixing building lines on each side of the stream, beyond which it may prevent the owners of lands bordering thereon from constructing their buildings, even though their title extends to the middle of the stream. And if the restriction be reasonable, a riparian owner is not entitled to compensation for that portion of his land which he is thus forbidden to use.

Where the city has adopted an ordinance fixing the middle of the stream as a base line and building lines on either side at a distance of 30 feet therefrom so as to keep the stream unobstructed at a width of 60 feet, and this width is found to be sufficient, it cannot thereafter, by permitting the riparian owners on one side of the stream to encroach upon and obstruct the stream on that side, under the guise of its police power, adopt an ordinance relocating the building line on the other side so as to maintain the width of 60 feet and by injunction prevent the owner of land on that other side from building upon the line as originally established. To deprive him of the use of the additional land, it must make compensation to him. (*West Virginia Supreme Court of Appeals, City of Welch vs. Mitchell*, 121 Southeastern Reporter, 165.)

Second European Summer School in Landscape Architecture

Special emphasis will be placed on town planning in the itinerary of the second European Summer School of Landscape Architecture, to be conducted under the direction of P. H. Elwood, Jr., Professor of Landscape Architecture, Iowa State College. To enrich the background and broaden the outlook of students and graduates of the fine arts is the object of this European Summer School. The party will sail from New York on June 17 and return via Montreal September 14. Full particulars can be secured by addressing Professor Elwood at Ames, Iowa.

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Plans for Neris les Bains, France

71.31 (44.57)

Indicating the spread of the idea of more intelligent town planning for small, as well as large, communities in France, it is to be noted that under the trained guidance of a Paris Urbanist the very ancient little town of Neris les Bains, near Montluçon, in the Department of Allier, is planning for its future growth. This is primarily a health resort with no important industry. The town is very ancient, there being many indications of its importance in Roman times and of the fact that the beneficent influences of its thermal springs were recognized long before this in the Celtic epoch. The town has been three times devastated—by the Huns, the Goths, and the Normans. It is not at present on a railroad line, but it is expected that one will soon be built, stimulating more rapid growth. In anticipation of this, in spite of present limited means, plans for new developments and improvements are being made. These include better facilities at the bathing establishment, the creation of promenades and open parked spaces for the bathers and visitors, and the improvement and extension of highways. All this is to be done with the utmost respect for the character of the older, narrower streets and their very ancient houses.

I. No. 324

Garden Cities, France

71.313 (44.382)

At Pierrepont, in the Department of Meurthe and Moselle, the Manufacturing Association, "Glorieux," has recently built a garden city. This is located on a low hill in a wooded district. For the benefit of employees having large families, 150 houses have been built, each with nine rooms. Each has an ample garden adapted to horticultural developments, which are encouraged by means of prizes. The Association has constructed schools for boys and girls, a building for shower-baths, a dispensary and a cooperative store. The provision for large families and the low rents—never higher than four francs per room per month—have served to increase the comfort of all.

I. No. 326

Groups of Houses ("Complexes") in Holland

71.43 (492)

It is sometimes difficult to define the particular character of a town, but that of Haarlem, in Holland, has been very definitely established by the Dutch writer, Van Deyssel, in his "Chats about Haarlem" ("Causerie van Haarlem"). A co-operative building society in this Dutch city, known as "On der Dak," has recently built a group of 52 houses; and, thanks to their architect, Rodenburgh, the very definite and peculiar characteristics of the town so well established have been respected in the new buildings and their grouping along Kleverlaan (Avenue Klever).

I. No. 328

Inexpensive Housing in France

33.332 (44)

The Société Française des Habitations à Bon Marché has recently published its report to the President of the French Republic for the year

1923. This very important document, prepared by the well-known French housing and town planning expert, Georges Risler, reviews a number of questions, including changes in legislation in regard to housing problems in France and other countries. In France he notes as important the resumption of activity on the part of the Societies for Inexpensive Homes, the total sum advanced to these organizations having been $3\frac{1}{2}$ times greater in 1922 than in 1921. For the Cooperative Societies the corresponding total has increased tenfold. Numerous projects completed or proposed by the Public Building Department are set forth in detail. The report analyses the work of the Federation of Building Societies; the present situation of the Rothschild, Lebaudy and other foundations; the Building and Loan Societies; and several private initiatives, such as those at Rheims and other garden cities in Northern France.

II. No. 451

Healthful Housing Conditions, Glasgow, Scotland

61.438.3 (41.43)

The City Council of Glasgow has decided to demolish a slum district of particularly miserable character and to rebuild new houses for the occupants. An interesting feature of the rearrangements is that iron beds will be installed, for it has been noted that wooden beds furnished for workmen's houses by the city of Amsterdam were burned by some of the tenants during a shortage of firewood.

II. No. 459

Strasbourg, Alsace, France

61.438.3 (43.445)

This city has, during the past year, undertaken an important step in solving its housing and congested traffic problems. In the heart of the town there was an old fortress surrounded by a slum area of narrow, ill-lighted streets and old houses. To aid in its struggle against such unhealthy conditions and its housing shortage, the city has undertaken what has been called "la grand percée," cutting through this old quarter an important, wide commercial street. In this connection, application has been made of a law that became part of the Civil Code during the German occupation ("Erbbaurecht" or "droit de superficie") granting the right of a form of "emphyteusis"—an agreement in this case extending over a period of 65 years with progressive rates of ground rental—all this with the purpose of encouraging building construction on the high-priced land along the new avenue. New lodgings or apartments have been built by the city or by means of financial support granted by the city to individuals. Besides this, the city cedes land under advantageous conditions in two outlying portions of Strasbourg.

II. No. 460

EDITORIAL NOTE.—In the *Tablettes Documentaires Municipales*, the publication of the International Union of Cities from which the foregoing items have been translated by Stephen Child, many other articles of municipal and civic interest are abstracted. In the original edition the name of the magazine or report from which each item has been prepared, is shown, together with the date and place of its publication. Readers of THE AMERICAN CITY who desire further information regarding this source of civic documentation can obtain it from Mr. Child at 538 Merchants Exchange Building, San Francisco, Calif.



Some of the new Harley-Davidsons now in service in Atlanta, Ga.



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The Motorcycle

Municipal and Civic Publications

Prices do not include postage unless so stated

Elements of Water Bacteriology.—By Samuel C. Prescott, Professor, Massachusetts Institute of Technology and C.-E. A. Winslow, Professor, Yale School of Medicine. Fourth edition, rewritten. John Wiley & Sons, Inc., New York. 1924. IX + 211 pp., including bibliography. \$2.25.

The fourth edition of this standard work on water bacteriology, the first edition of which was published nearly twenty years ago, is devoted to the work of the practical water bacteriologist. It incorporates all of the available new matter, including the latest recommendations of the Committee on Standard Methods of the American Public Health Association and reduces materially the amount of space devoted to the highly technical isolation seldom employed. The various chapters consider the bacteria in natural waters, the quantitative bacteriological examination of water and its interpretation, a study of the organisms developing at body temperature, the colon group of bacilli and methods for their isolation, significance of the colon group in water, other intestinal bacteria as indices of pollution, the significances and applicability of bacteriological examinations, the bacteriology of sewage and sewage effluent, and the bacteriological examination of shellfish.

Appraisers' and Adjusters' Handbook.—By William Arthur. U. P. C. Book Company, Inc., New York. 1924. XVII + 616 pp. \$5.00.

This book is in handy size, measuring $7\frac{1}{4}$ x $4\frac{1}{4}$ inches and one inch thick, so that it can be a real handbook for those who are engaged in valuation work. The detailed analyses and tables of data on building costs arranged by individual processes and materials and the discussion of depreciation are truly interesting. They are arranged in such a way that the assessor, the appraiser or the valuation engineer or other evaluating official may make instant use of them. Part I deals largely with general principles, square and cubic foot costs, percentages of the various kinds of work, comparisons and approximate estimating. Part II shows how the detailed costs may be found. The tables are especially compiled for quick reference. This should be a helpful volume for municipal and county officials engaged in appraisal work.

Home Sewage Disposal.—By W. A. Hardenbergh, Sanitary Engineer and Director of Rural Sanitation, Jefferson County Board of Health, Alabama. J. P. Lippincott Company, Philadelphia. 1924. Illustrated. VII + 274 pp. \$2.50.

This helpful book has been prepared especially for health officers and health workers in the field, to furnish reliable data to engineers and others engaged or interested in sewage disposal in single homes, small communities and institutions and isolated comfort stations in parks, at beaches, etc. After a general discussion of the need for sanitation and the general principles of sanitation, the book takes up the various methods of disposal, including the pit privy, septic closets, chemical tank closets, the disposal of excreta, small septic tanks and small Imhoff tanks, as well as secondary methods of treatment. This is a book which every small-town health officer and many in the larger communities should have for immediate reference.

The Communicable Diseases.—By Allan J. McLaughlin, M. D., Surgeon, United States Public Health Service. Harper & Brothers, New York. 1923. X + 269 pp. \$3.00.

A book designed to educate the great intelligent group which comes between that of the specialists and technicians and the class that can digest only the simple leaflet of "Don'ts." The facts are plainly stated without theoretical discussion. The diseases covered are those usually reportable by law to the health department. The readers to whom this book will appeal are those who will, by word and example, educate those around them.

International Association of Fire Engineers.—Proceedings of the Fifty-First Annual Convention of the Association held at Richmond, Va., October, 1923. 331 pp. (Apply to James J. Mulcahey, Secretary, Yonkers, N. Y.)

Public Health in the United States.—By Harry H. Moore. With an Introduction by Haven Emerson. Harper & Brothers, New York. 1923. XIX + 557 pp. Illustrated. \$4.00.

A compact presentation of important facts regarding the nation's health, under a unique classification. Part I is, Man's Concern Through the Ages for His Health. Part II—The Human and Economic Costs of Disease—includes chapters on: What Makes Men Die Before Their Time?; Sickneses Which Disable; Defects and Minor Ailments; The Economic Costs of Disease. Part III—The Warfare Against Disease—covers: The Conquest of Science; Unconquered Enemies; Enemies Not Yet Attacked. Part IV—The Exploitation of Ignorance Regarding Disease—deals with: Nostrums and Quackery; Health Activities More or Less Misdirected. Part V—The Conquest of Disease by Health—tells of Health Organizations; The School—a Super-Health Organization; Organized Recreation; The Dispensary, the Clinic, and the Health Center; Health Service in Industry; Other Significant Health Activities. Part VI—The Expanding Field of Public Health—embraces Economic and Sociological Aspects of Public Health; The Socialization of Preventive and Curative Medicine; The Problem of Personnel; Public Economy and Public Health; Prospects of a Forward Movement. The appendices contain much valuable material.

Our City—New York.—By the High School Students of New York City, under the supervision of Frank A. Rexford. Allyn and Bacon, Boston. 1924. XXV + 400 pp. Many illustrations. \$1.20.

Hundreds of high school students took part in the preparation of this book. The best work on the book in each of nineteen schools developed into a chapter. Great assistance has been given to the schools in the study of civics, by city departments, bureaus, civic organizations and individuals. This volume was produced in 1923 as part of a survey of the work of the public schools of New York City. It covers: water-supply, food protection; regulation of buildings; waste disposal; regulation of work; provision for recreation; guarding the health; welfare of the unfortunate; protection of life and property; city planning; communication and transportation; lighting and heating; making and executing laws; courts; correction of delinquency; finance; voting; education.

The Hoboken City Hall.—Issued frequently by the Bureau of Municipal Research, Chamber of Commerce, Hoboken, N. J. 4 pp. Handy size. The issue of April 7, 1924, states the purpose of the bulletin—to "treat of the different matters having to do with the administration of the affairs of the city of Hoboken"; and deals with the revised miscellaneous revenue rates embodied in a series of ordinances introduced by the Board of Commissioners on April 7; and also with the exemption from municipal taxation of the Shipping Board piers. (Apply to the Bureau.)

Better Homes in America.—Why and How to Teach Civic Effectiveness, as Illustrated by School Participation in the Community Better Homes Campaign. By Elizabeth Carlisle, Head of Civics Department, Washington Junior High School, Port Huron, Mich. Foreword by James Ford, Executive Director, Better Homes in America. Publication No. 2, March, 1924, of Better Homes in America, National Headquarters, 1653 Pennsylvania Avenue, Washington, D. C. Describing the most significant of the local home demonstrations—that in Port Huron, Mich., under the direction of the author of this pamphlet. (Apply to the National Headquarters.)

An Inventory of Proposed City Projects, Duluth, Minn.—In "The Taxpayers' Business," issued by the Taxpayers' League of St. Louis County, Inc., Duluth, Minn. February 25, 1924. 16 pp. Answering the questions: What Do We Want? What Do We Need? What Can We Afford? The cost of the proposed improvements approximates \$40,000,000. They cover sanitation, public health, safety; traffic facilitation—paving; public service and convenience; education; parks and recreation. (Apply to the League, 213 Torrey Building, Duluth, Minn.)



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Concrete Lateral Sewer
Internal diameter 24"
Portland, Oreg.

Concrete Meets Every Sewer Requirement

Concrete Pipe Sewers in America are 80 years young. The first one of record was laid in 1842 at Mohawk, N. Y.—more than eighty years ago.

Concrete Pipe Sewers have been in use in Hudson, N. Y., since 1867; in Nashua, N. H., since 1868; in Kokomo, Ind., since 1873; in North Adams, Mass., since 1874; in Butte, Mont., since 1889.

Recent inspection of these sewers has shown that they are still in perfect condition.

Concrete Pipe Sewers sustain the earth pressure in deep trenches. Even when they are near the surface, they meet all requirements for supporting the weight of traffic.

Due to the impermeability of well-made Concrete Pipe, leakage and infiltration are eliminated. Concrete Pipe are true to shape and form. As a result their smooth interior surface provides maximum flow capacity.

These are a few of the reasons why so many municipal engineers are giving preference to Concrete Pipe Sewers.

* * *

Concrete Sewer Pipe is manufactured in standard sizes from 4 to 108 inches, internal diameter. The smaller sizes are unreinforced and meet specification requirements of the American Society for Testing Materials. Larger sizes are reinforced.

Our booklet C-3 tells many interesting things about Concrete Pipe Sewers. Address nearest office for your copy today.

PORTLAND CEMENT ASSOCIATION

A National Organization

to Improve and Extend the Uses of Concrete

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Our Booklets are sent free only in the United States, Canada and Cuba.

Minor Highway Privileges as a Source of Municipal Revenue in Nine Cities of the United States.—Including sub-sidewalk vaults or tunnels, overhanging signs, building balconies or other projections, switch tracks, etc. Report prepared by Bureau of Statistics and Municipal Reference Library, 1005 City Hall, Chicago, Ill. March, 1924. 12 typewritten pp. (Apply to Frederick Rex, Municipal Reference Librarian.)

Public Indebtedness in Indiana.—Tables showing bonded and other interest-bearing indebtedness of the state of Indiana and of each county, civil township, civil city, school city, civil town, and school town thereof. Prepared by the Legislative Reference Bureau, Indianapolis. Bulletin No. 5, Vol. IX, of the Extension Division, Indiana University, January, 1924. 39 pp. (Apply to the Bureau, State House, Indianapolis.)

Plan Book of Small Homes.—Three, Four, Five and Six Rooms. Prepared for Better Homes in America by the Architects' Small House Service Bureau of the United States, Inc. 1924. Photographs and plans. 32 pp. 25 cents. (Apply to the Bureau, 1200 Second Ave., South, Minneapolis, Minn.)

Business-Managing Our Cities.—By Dorsey W. Hyde, Jr., Assistant Manager, Civic Development Department, Chamber of Commerce of the United States. Reprinted from The Nation's Business for March, 1924. 6 pp. (Apply to the author.)

Mistakes to be Avoided in Zoning.—By Lawrence Veiller, Secretary, National Housing Association. Address before the convention of National Association of Real Estate Boards, June 28, 1923. Issued by The City Plan Commission, Detroit, Mich., September, 1923. 7 pp. (Apply to the Commission.)

Comparative Statement of Expenditures.—Presents a comparative statistical study of municipal expenditures for Colorado cities and towns having a population of 2,000 or over in 1922. Prepared by Bureau of Business and Governmental Research, Extension Division, University of Colorado, Boulder, Colo. Figures were taken from annual statements published by the various cities represented. 10 mimeographed pages. (Apply to the Bureau.)

Recarbonization of Softened Water.—By Nicholas S. Hill, Jr. Reprinted from the Journal of the American Water Works Association, March, 1924. 16 pp. (Apply to the author, 112 E. 19th Street, New York, N. Y.)

The Cantata of the Garden Cities.—Music by Magalyo. Words by Georges Lauweryns. Published by Georges Benoit-Lévy, 11 rue Malebranché, Paris, France. 3 copies 4 shillings. (Apply to the publisher.)

Motor Vehicles.—Three pamphlets: Special Taxation for Motor Vehicles, 27 quarto pp.; Governmental Restrictions on Motor Vehicle Sizes, Weights and Speeds, 25 pp.; Governmental Regulation of Motor Vehicle Common Carriers, 27 pp. Published by Motor Vehicle Conference Committee, 366 Madison Avenue, New York, N. Y. January, 1924. (Apply to the publishers.)

Municipal Bond Sales.—A record of the domestic and foreign government, state and municipal bond sales in the United States during the year 1923. Published by The Bond Buyer, 67 Pearl Street, New York, N. Y. 113 pp. \$10. (Apply to the publishers.)

West Hartford Zoning.—By Robert Whitten. Report to the Zoning Commission on the zoning of West Hartford, Conn., explaining the proposed zoning regulations and discussing steps that should be taken in the future to provide in a comprehensive way for the planning of the unsubdivided areas. March 3, 1924. 20 pp. (Apply to the author, 4614 Prospect Avenue, Cleveland, Ohio.)

National Health Series.—Five pocket-size books with flexible covers: Community Health—How to Obtain and Preserve It, by Donald B. Armstrong, M. D., Sc. D., Executive Officer, National Health Council, 65 pp.; Man and the Microbe—How Communicable Diseases Are Controlled, by Charles-Edward Amory Winslow, Dr. P. H., Professor of Public Health, Yale School of Medicine, 68 pp.; The Baby's Health, by Richard A. Bolt, M. D., Gr. P. H., Director, Medical Service, American Child Health Association, 38 pp.; Personal Hygiene—The Rules for Right Living, by Allen J. McLaughlin, M. D., Surgeon, U. S. Public Health Service, assisted by James A. Tobey, M. S., Administrative Secretary, National Health Council, 63 pp.; Cancer—Nature, Diagnosis, and Cure, by Francis Carter Wood, M. D., Director, Institute of Cancer Research, Columbia University, 67 pp. 1924. 30 cents each. (Apply to Funk & Wagnalls Company, New York.)

Why Cities Are Changing to Commission-Manager Form of Government.—By R. E. McDonnell. Pocket size. 8 pp. 2 folding maps. (Free on application to Burns & McDonnell, consulting engineers, Kansas City, Mo.)

Examples of Community Enterprises in Louisiana.—By Augustus W. Hayes, Associate Professor of Sociology, The Tulane University of Louisiana. Research Bulletin No. 3, October, 1923, issued by the University and the United States Department of Agriculture co-operating. 48 pp. Illustrated. Bringing out in every case how the institution, organization or enterprise reached its present status, what it is doing, and how it keeps functioning; often told in the words of the workers themselves. (Apply to The Tulane University of Louisiana.)

Industrial Schools.—Organization and Administration of General Industrial Schools or Classes in Communities of Less Than 25,000 Inhabitants. University of the State of New York Bulletin, October 1, 1923. 17 pp. Prepared by Robert H. Rodgers, supervisor of industrial education. The revised plan for this type of work has decreased the required number of hours devoted to the industrial subjects, thereby making it possible to develop a general industrial education program in conjunction with the regular academic subjects of the grade or high school. (Apply to Lewis A. Wilson, Director, Division of Vocational and Extension Education, University of the State of New York, Albany, N. Y.)

First Aid to Traffic—What to Do Till the City Planner Comes.—Suggestions for the Prevention of Traffic Accidents. By George G. Kelcey, Manager, Engineering Division, American Gas Accumulator Company, Elizabeth, N. J. Excerpts from papers presented before the United States Committee for the District of Columbia and the National Safety Council at its Annual Congress in Buffalo. Reprinted through the courtesy of the National Safety Council from the November, 1923, issue of "Highway Transportation," New York. 12 pp. Photographs, diagrams. Suggesting avenues of investigation by municipalities, leading to plans of action which will take advantage of existing opportunities for traffic improvement at the least expense. (Apply to author.)

Platting Guide, Milwaukee, Wis.—For owners, realtors, engineers and agents who expect to subdivide land into lots within a mile and a half beyond the city limits. Suggestions recommended by the Milwaukee Real Estate Board and the Committee on Buildings, Grounds and Bridges of the Common Council. 31 quarto pp. Maps, views, diagrams. 25 cents. Published by the Board of Public Land Commissioners. January, 1924. (Apply to Gardner S. Rogers, City Planning Engineer of the Board.)

Prison Industries.—Message from the Governor of New York State Recommending Reorganization of the Prison Industries, with a Report by the Board of Estimate and Control on the Prison Industries. Legislative Document (1924) No. 55. 48 pp. The Governor believes that in order to solve the problems presented, "we must set up an industrial organization which, as nearly as present conditions permit, will parallel industrial organizations in private life." (Apply to the State Board of Estimate and Control, Albany, N. Y.)

The Civic Federation of Dallas, Texas.—Seventh Annual Directory, 1924. Listing the Dallas agencies for civic and social progress and promotion of health and education, and state organizations and boards. Compiled and published by the Civic Federation of Dallas, 415-18 Mercantile Bank Building, Dallas, Texas. February, 1924. 25 cents. 32 pp. (Apply to the Federation.)

Education Law, New York State.—As amended to July 1, 1923. University of the State of New York Bulletin, June 15, 1923. 381 pp. (Apply to Lewis A. Wilson, Director, Division of Extension Education, Albany, N. Y.)

City Ordinances.—What Our City Councils Are Doing. Brief list of references to ordinances introduced in, or passed by, the city councils of large cities from September 1, 1923, to February 25, 1924. 5 mimeographed sheets. 2 cents postage. (Apply to Municipal Reference Library, 1005 City Hall, Chicago, Ill.)



North High Street, Cedar to Fifth Ave.,
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Asphalt Streets in Columbus, O.

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Centuries B. C., Nabopolassar, King of Babylon, used asphalt as a binder for street construction. Nebuchadnezzar, his son, employed it even more extensively.

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Harmon Foundation.—Year Book for 1923. Published February, 1924. 23 pp. (Apply to the Foundation, 140 Nassau Street, New York, N. Y.)

Fitchburg, Mass.—Annual Report of the Commissioner of Public Works for 1922. (Apply to David A. Hartwell, Commissioner of Public Works.)

Goderich, Ont.—Auditors' Financial Statement for 1923. (Apply to either of the auditors, A. M. Robertson or H. R. Long.)

Johnstown, N. Y.—Annual Report of the Board of Water Commissioners, for 1923. (Apply to Thomas A. Sutton, President of the Board.)

Kalispell, Mont.—Annual Report of the Water Department for 1923. (Apply to W. H. Lawrence, Superintendent.)

Lynchburg, Va.—Annual Report of city for year ending January 31, 1924. (Apply to Edward A. Beck, City Manager.)

Pasadena, Calif.—Sixteenth Annual Report of the Municipal Light and Power Department, for 1922-1923. (Apply to C. W. Koener, City Manager.)

Waynesboro, Pa.—Annual Statement of the Borough of Waynesboro, Pa.—Showing the financial condition of the borough and containing a statement of receipts and expenditures for the fiscal year ending December 31, 1923. (Apply to A. Stover Fitz, Borough Manager.)

Wilmington, Del.—Annual Report of the Board of Water Commissioners for the fiscal year 1922-1923. (Apply to S. Newbold Van Trump, Chief Engineer of the Water Department.)

On the Calendar of Conventions

MAY 7-8.—PARIS, TEX.

League of Texas Municipalities. Annual convention. Executive Secretary, Frank M. Stewart, Government Research Division, Bureau of Extension, University of Texas, Austin, Tex.

MAY 10-13.—WASHINGTON, D. C.

American Association of Museums. Annual meeting. Secretary, Laurence Vail Coleman, American Museum of Safety, 141 East 29th Street, New York, N. Y.

MAY 13-15.—ATLANTIC CITY, N. J.

National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 40 Central Street, Boston, Mass.

MAY 19-23.—ATLANTIC CITY, N. J.

National Electric Light Association. Annual meeting. Executive Manager, M. H. Aylesworth, 29 West 39th Street, New York, N. Y.

MAY 19-24.—NEW YORK, N. Y.

American Water Works Association. Annual convention. Address: W. M. Niesley, 170 Broadway, New York, N. Y.

MAY 20-22.—LIMA, OHIO.

National Firemen's Association of the United States. Annual convention. Secretary, Capt. J. E. Mersch, 750 Chicago Avenue, Evanston, Ill.

MAY 21-23.—WASHINGTON, D. C.

American Institute of Architects. Annual convention. Executive Secretary, E. C. Kemper, The Octagon, Washington, D. C.

MAY 26-29.—WASHINGTON, D. C.

Annual Conference on Weights and Measures. Secretary, H. E. Holbrook, Bureau of Standards, Department of Commerce, Washington, D. C.

JUNE 3-5.—ROCHESTER, N. Y.

Conference of Mayors and Other City Officials of the State of New York. Annual conference. Secretary, William P. Capes, 25 Washington Avenue, Albany, N. Y.

JUNE 3-6.—WASHINGTON, D. C.

National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, 1428 Consumers Building, Chicago, Ill.

JUNE 5-7.—MINERAL WELLS, TEX.

Texas Commercial Executives' Association. Annual convention-school. Secretary, O. C. B. Nair, Corsicana, Tex.

JUNE 5-7.—CINCINNATI, OHIO.

United States Junior Chamber of Commerce. Annual convention. Secretary, Elias Roos, Brumder Building, Milwaukee, Wis.

JUNE 9-14.—DETROIT, MICH.

National Assembly of Civil Service Commissions. Annual meeting. Secretary, Charles S. Shaughnessy, Civil Service Commission, Philadelphia, Pa.

JUNE 10-12.—KENSINGTON, PA.

Pennsylvania State Association of Boroughs. Annual convention. Secretary, J. Herman Knisely, Capitol Building, Harrisburg, Pa.

JUNE 11-14.—SAN FRANCISCO, CALIF.

American Association of Engineers. Annual convention. Secretary, C. E. Drayer, 63 East Adams Street, Chicago, Ill.

JUNE 13-14.—MIDDLETOWN, OHIO.

Ohio Commercial Secretaries Association. Annual meeting. Secretary, Avery G. Clinger, Chamber of Commerce, Columbus, Ohio.

JUNE 17-19.—PROVIDENCE, R. I.

National Association of Comptrollers and Accounting Officers. Annual convention. Secretary, Mark M. Foote, Comptroller's Office, Chicago, Ill.

JUNE 19-20.—DETROIT, MINN.

League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, The Municipal Reference Library, University of Minnesota, Minneapolis, Minn.

JUNE 23-27.—CHICAGO, ILL.

American Institute of Electrical Engineers. Annual convention. Secretary, F. L. Hutchinson, 33 West 39th Street, New York, N. Y.

JUNE 24-26.—BOSTON, MASS.

New England Association of Fire Chiefs. Annual convention. Secretary, Chief John W. O'Hearn, Watertown, Mass.

JUNE 24-27.—NEW BRUNSWICK, CANADA.

Canadian Good Roads Association. Annual convention. Secretary, George A. McNamee, 909 New Birks Building, Montreal, Que.

JUNE 25-JULY 2.—TORONTO, ONT.

American Association for Community Organization. Annual meeting. Secretary, Pierce Williams, care National Information Bureau, 1 Madison Avenue, New York, N. Y.

JUNE 25-JULY 2.—TORONTO, ONT.

National Conference of Social Work. Annual meeting. Secretary, William H. Parker, 25 East 9th Street, Cincinnati, Ohio.

JUNE 30-JULY 5.—SARATOGA SPRINGS, N. Y.

American Library Association. Annual meeting. Executive Secretary, Carl H. Milam, 78 East Washington Street, Chicago, Ill.

JULY 2-9.—AMSTERDAM, HOLLAND.

International Town Planning Conference. Address: Organizing Secretary, International Garden Cities and Town Planning Federation, 3, Gray's Inn Place, London W. C. 1, England.

JULY 14-18.—MONTREAL, CANADA.

International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

JULY 20-26.—PALO ALTO, CALIF.

Western Summer School of Community Leadership. Address: Professor Edwin A. Cottrell, Stanford University, Calif.

JULY 20-AUGUST 2.—EVANSTON, ILL.

National School for Commercial and Trade Executives. Address: Robert B. Beach, Business Manager, Chicago Association of Commerce, Chicago, Ill.

AUGUST 19-22.—BUFFALO, N. Y.

International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y.

SEPTEMBER 23-26.—ROCHESTER, N. Y.

New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

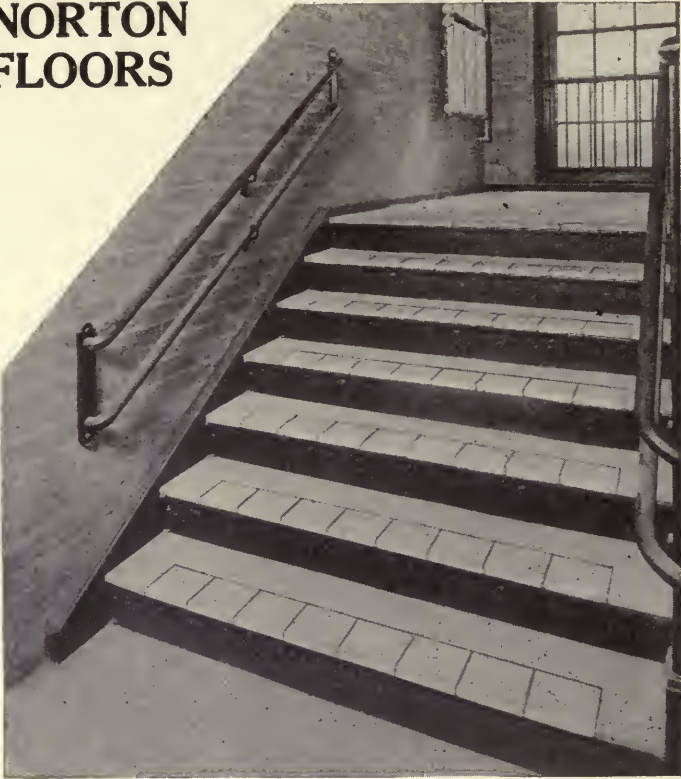
SEPTEMBER 29-OCTOBER 3.—BOSTON, MASS.

American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, St. Petersburg, Fla.

OCTOBER 20-22.—WASHINGTON, D. C.

National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, Raymond B. Gibbs, Kansas City, Kans.

NORTON FLOORS



Meet Schoolhouse Requirements

Safety and durability are the chief requisites of schoolhouse construction. Norton Floors meet both for they are slip-proof and wear-resisting.

The Clifton Park High School, Baltimore, is one of many where Alundum Tile has been used on the stairways to make them safe for the careless hurrying feet of children and to prevent worn hollows due to the unusually severe traffic to which such stairways are subjected.

There is a Norton Floor suitable for all types of schoolhouse construction.

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Patching with Rock Asphalt

Many cities are using Kyrock, the rock asphalt produced by the Kentucky Rock Asphalt Company, Marion E. Taylor Building, Louisville, Ky., for patching old pavements, and are finding it both satisfactory and economical. Kyrock has the advantage of being laid cold and is always ready to lay without mixing or special equipment.

The time to repair a break in a pavement is when the break occurs. It is often true in smaller cities without heating and mixing equipment that street maintenance is neglected until a complete new pavement is required. Cities and counties using rock asphalt for maintenance keep a supply of material in storage and mix and repair as soon as it is needed.

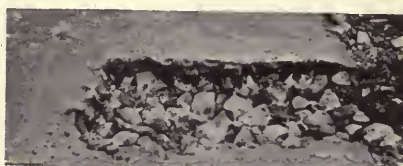
When asphalt pavements are to be patched with rock asphalt, the old surface should be cut away, leaving the edges perpendicular. The base is then restored and the hole cleaned out. Dirt and dust must be removed, and this can be done either by brooming or with a bellows. The edges of the old surface should be painted with an asphaltic cement, which is not necessary where an old pavement of rock asphalt is being repaired. The hole is then filled with the rock asphalt and crowned up slightly above the old pavement. It is tamped thoroughly, and the patch is complete. After a few days' traffic the patch may not be distinguished from the surrounding pavement.

Where slight depressions occur in an asphalt pavement, rock asphalt skin patches are successful. The old asphalt need not be disturbed, but should be thoroughly cleaned. The area should be painted before the rock asphalt is applied, and the patch may be feathered at the edges.

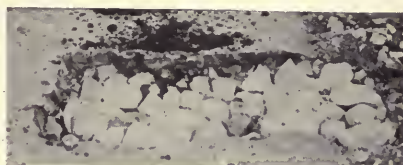
In patching old brick or block pavements, it is often necessary to remove the bricks to repair the base. In such cases the base, if concrete, may be restored by filling the hole with cement concrete, pouring the mixture to within 1½ inches of the top of the old surface. The hole should then be cleaned and painted with asphaltic cement before the rock asphalt is shoveled into place and tamped.

Most patching of brick pavement, however, is required because of slight depressions due to settling or to actual wear of the bricks. Because of its fine sand aggregate, Kyrock is especially adapted to such work. The edges of the patch feather out to almost nothing.

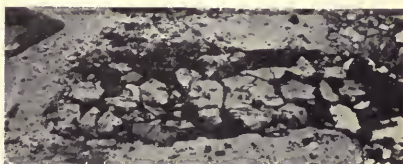
In patching brick or block pavements with Kyrock, the hole should be coated with an



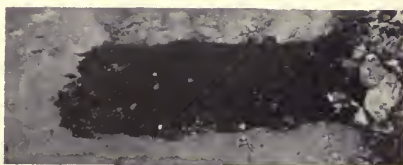
Cut away the old surface



Repair the foundation



Old rock asphalt may be used again



Fill with rock asphalt and crown



Tamp, and the patch is complete

HOW TO PATCH WITH ROCK ASPHALT

asphaltic paint to protect the patch from moisture and to absorb any dust on the old surface. This is particularly important in making feathered-edge patches. Asphaltic cement used as a paint coat should be either an asphalt cut back with gasoline or an asphalt emulsion.



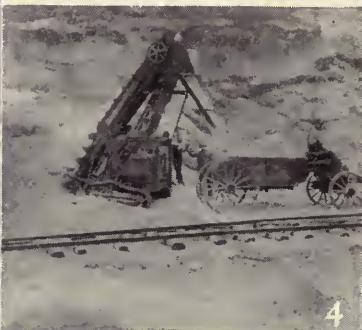
1—This Barber-Greene saved McGuire & Rolfe, Inc., \$3000 last season, picking up excavation in Richmond, Va.

2—Working in close quarters at McGrady Bros., Pittsburgh, five yards of material were loaded in three minutes.

3—The disc feeder digging into stone. No shovel clean-up is ever needed.

4—In the summer, Worcester, Mass., converts its snow loader into a bucket loader. It loads a gravel car in one-fourth the time eight men previously required.

5—The street commissioner of Worcester says his Barber-Greene Snow Loader takes the place of 100 men.



The double-purpose loader

Loading sand and stone in summer—loading snow in winter

The same Barber-Greene that can clear a heavy snow from an entire city block in 15 minutes, can with a slight change replace a gang of 10 to 20 men on street paving in the summer.

The snow boom is quickly replaced with a bucket loader boom, and the Barber-Greene is prepared for a season's work in sand or gravel, coal or cinders.

With its disc feeder, it digs into material, cleaning it up without the aid of a single shoveler.

A single Barber-Greene Bucket Loader sped up production 40% and eliminated a large labor gang for the Trinidad Asphalt Company, on a street paving job in St. Louis, Mo. It brought about an average daily run of 1,555 square yards, with a maximum of 1,777 square yards.

McGuire & Rolfe, Inc., of Richmond, Va.,

used two Barber-Greenes. One of them, loading gravel from storage piles, handled 18 cubic feet in 30 seconds—and 20,000 tons in a season. The other machine was used at an asphalt plant and on subgrade work. Replacing 8 to 10 shovelers at picking up excavation, it saved the company \$3,000.

Cities that have found the Barber-Greene to be the swiftest, most flexible and economical of all bucket loaders, have also found it to be the one best means of minimizing the business losses that formerly accompanied every heavy snow.

Our two booklets, "Mechanical Snow Handling" and "Results on Road Jobs," show in a striking way the snow-removal methods and the road-building methods adopted in many different sections of the country. They explain the double economy of the Barber-Greene. Send for them now.

BARBER-GREENE COMPANY—Representatives in Fifty Cities—515 W. Park Avenue, Aurora, Illinois

BARBER

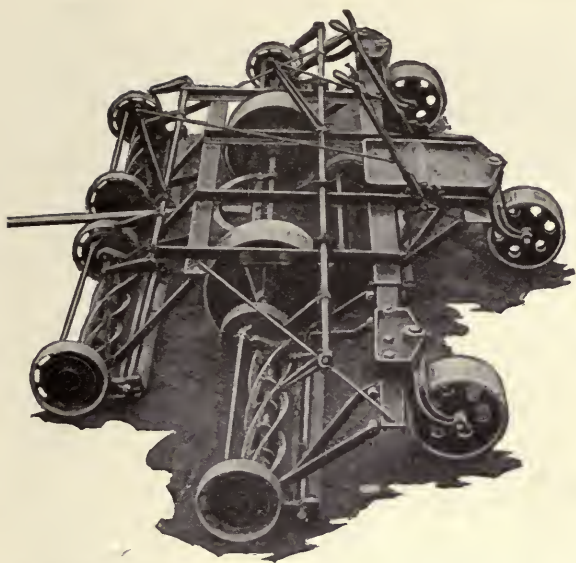
Portable Belt Conveyors



GREENE

Self Feeding Bucket Loaders

Automatic Ditch Diggers



A FIVE-MOWER HITCH FOR USE WITH A LIGHT TRACTOR

Improving Public Grounds

Superintendents of parks, cemeteries and public grounds find that their appropriations for lawn maintenance require close figuring. Usually the labor is limited and employees are unskilled. For these reasons, they must consider labor-saving features of motor-operated lawn-mowers. Three- and five-unit machines drawn by Fordson or other light tractors make ideal combinations.

The Ideal Power Lawn Mower Company, 400 Kalamazoo Street, Lansing, Mich., makes a fast, dependable mowing outfit, which is used on a great number of golf courses, public parks and other large grounds where there is a power-plant in use for general duties. By utilizing the light tractor already owned by the city, it is possible to avoid the purchase of additional power equipment. This outfit in three- or five-unit combination provides particular advantages, inasmuch as the Ideal Bull Dog cutting units are especially designed for power cutting. The mower has levers for raising the cutting units, and wide-faced traction wheels and casters for carrying the weight of the assembly. The outfit is a distinct economy and improvement over the horse-drawn mower and is said to quickly pay for its cost in the saving of labor and the improved appearance of the lawn. It is guaranteed by the manufacturer to stand the hard, steady grind of mowing grass behind a Fordson or other light-weight tractor. The assembly is so built that there is no bearing weight on the cutting units, which swing freely by suspension hangers. The power for turning the cutter reel is derived entirely from the traction of the cutting wheels of the cutting unit.

Each cutting unit operates independently, thus preventing possible injury to the entire outfit. Should an obstruction strike one of the blades, it would be unlikely to cause breakage, as it merely stops the rotation of the individual cutting unit, causing the wheels to slide.

The same method of attaching cutting mowers to the frame is employed as in all other Ideal mowers. The mowers are pushed the same as

a hand mower is pushed—at the side plates, instead of pulling from the shrub rod. This holds the mower to its work and prevents the back from jumping up in heavy grass.

The device can be quickly detached from the tractor by unhooking the simple clevis and draw-bar hitch, thus releasing the tractor for other work.

Park Cable for Series Lighting Circuits

A new park cable, intended for use in series lighting circuits for municipal street lighting, white way installations and park or playground illuminating systems, has been placed on the market by the Simplex Wire and Cable Company, 210 Devonshire Street, Boston, Mass., under the name of Condex park cable. This cable consists of an insulated lead-covered conductor, such as is ordinarily used for series street-lighting circuits, protected by an interlocking steel tape under and over which is a bed saturated with a preservative compound. It is claimed to be a distinctly different type of steel-taped cable from that which has been used so extensively during the last

15 or 20 years.

The flexible locked steel conduit is a steel tape applied spirally around the lead-covered conductor. This steel armor and the unique way in which it is applied form the main distinguishing feature of Condex park cable. The steel completely covers the cable under all conditions and is securely locked together in such a way that there is little possibility of any portion of the cable becoming exposed to mechanical injury. The arch form of the overlapping, interlocking steel gives unusual resistance to crushing.

The bedding between the lead and the steel tape consists of a fabric of sufficient weight and thickness to furnish ample protection. Before being applied, it is thoroughly impregnated with a preservative compound. The outer covering is a serving of jute thoroughly saturated with preservative compound similar to that used on the bedding. The outer surface of the cable is finished so that it is not objectionable to handle.

The preservative compound which is applied over the lead and between the various protecting layers prevents rotting and deterioration of the fabric by moisture or from other causes. It also covers the entire surface of the steel, working itself into the overlapping locking feature in such a way as to insure the flexible conduit against rusting.

With this type of cable, conduits are unnecessary and manholes need not be constructed. Very little digging is required to obtain a satisfactory installation, as the cable can be laid in a shallow trench in the ground, where it is feasible to dig such a trench, or it can be placed under the pavement on a city street by simply removing one course of paving blocks and placing the cable in the bedding under them.





CIVIC IMPROVEMENTS

economically and permanently accomplished by Excelsior Fence

Installation shown is an Excelsior Rustproof Chain Link, the ORIGINAL Hot Galvanized After Weaving Chain Link Fence, proved to be the most durable by more than five years' actual service under all kinds of conditions.

Excelsior Rustproof Ornamental Wire Fence is the strongest and most durable ornamental wire fence made.

Excelsior Iron Fence and Gates furnished in a variety of designs and sizes.

The Wickwire Spencer engineering department will be glad to furnish recommendations and estimates of fence types to meet your particular requirements.

Catalog upon request.



WIRE FENCES

WICKWIRE SPENCER STEEL CORPORATION

Fence Department

WORCESTER, MASSACHUSETTS

New York

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Detroit

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San Francisco

Los Angeles



"CLOSE UPS" OF FAMOUS SEWER BUGS

Sanitary Sewers an Aid to the Health of the Community

Many home owners when calculating the cost of sewers and water-works fail to consider the expense resulting from the repeated cleaning of the old style of privy vaults or cesspools. Cleaning must be done periodically, and the cost may vary from \$5 to \$19 per load. Several loads must be frequently taken out. This money would go far toward paying the cost of sanitary sewers. After the sewers are put in there is no cleaning charge to pay. To the expense of cleaning privy vaults or cesspools, there must be added the offensiveness of odors which necessarily accompany the job of cleaning.

When you send your child to school, you must take into account the contacts he will make there, physical, mental and moral. If there are no sewers, and sanitary conditions in the town are bad, your child will have many chances to contract contagious diseases. If the toilets, the lavatories and the drinking arrangements of the school are old-fashioned and unsanitary, you need not be surprised at his bringing diseases home. When the city does not have the protection afforded by pure water and sewers, an epidemic may break out at any time and sweep unhindered through the entire community. Schools should abolish the outdoor toilet, which is always a breeder of disease and frequently of immorality. A modern school with sewer connections does not have this dangerous institution.

Stagnant pools, ponds, open drains, decomposing refuse, open privies and cesspools help to keep alive the mosquitoes and flies which carry the germs of malaria, typhoid, tuberculosis, dysentery, etc. Sanitary sewers offer remedies for such insanitary conditions.

The W. S. Dickey Clay Manufacturing Co., 203 New York Life Building, Kansas City, Mo., and the Clay Products Association, 133 West Washington Street, Chicago, Ill., are distributing an interesting pamphlet, "Disease Devils—Let's Help Chase Them Out of Town," the front cover of which depicts the caricatures of the germs of malaria, typhoid, influenza and tuberculosis, shown above.

This booklet, which is devoid of advertising, is admirable for use in sewer bond campaigns as a piece of educational literature.

Stationary Circular Travel Rings

A very interesting piece of playground apparatus in the shape of stationary circular travel rings which do not revolve, is made by the Patterson-Williams Manufacturing Company, 501-507 West San Fernando Street, San Jose, Calif. In spite of the fact that this apparatus does not revolve, it furnishes an endless-ring path which permits children to swing from ring to ring, pulling, stretching and developing every muscle of their bodies. Unlike the straightaway travel rings, the circular arrangement forces reaching and stretching of the arms and legs in a position different from similar apparatus. Races can be held on the apparatus, as the path is as long as the child cares to go around. It is an economical piece of apparatus for the reason that it is long enough for the hardest and yet occupies the minimum space.

The rings are mounted in a 9-foot circle, 3 feet apart, making it an interesting feat to negotiate one ring after another. The rings are so arranged that they can be used as gymnastic rings by four children at a time. An inclined board is furnished with the outfit for the use of smaller children in starting. Because of its circular arrangement, the outfit requires approximately one-twelfth of the space of the ordinary traveling rings. The rings themselves are of aluminum bronze with an aluminum grip. The apparatus stands 12 feet high and weighs 270 pounds without the supporting pipe, and 470 pounds with it. The aluminum hand-grip rings are mounted 6 feet 3 inches from the ground, and all parts of the equipment are galvanized.



AN ENDLESS LINE OF SWINGING RINGS



This high, unclimbable Anchor Post Chain Link Fence safeguards the water supply of the City of Newark, N. J. It surrounds the Cedar Grove Reservoir.

Effective Protection Against Water Pollution

Maintaining the purity of water supply, in the face of many possible sources of pollution, is a job of no mean proportion.

Even though the Waterworks Superintendent or Engineer provides almost every possible safeguard against contamination—should he fail to provide just one reasonable means of protection, he is exposed to censure and blame.

A high, unclimbable Anchor Post Fence, of the type shown above, is an unfailing ally of the Waterworks

Superintendent or Engineer—and a very necessary means of reservoir protection. It is an ever-vigilant watchman—an impassable barrier against every trespasser danger.

If your reservoirs are unfenced—still open to many possible sources of pollution—the consideration of adequate fence protection deserves your immediate attention. A phone call, wire or letter to the nearest Anchor Post office or sales agent will bring you full cooperation and complete information regarding reservoir fences.

ANCHOR POST IRON WORKS, 52 Church St., New York, N. Y.

Branch Offices:

BALTIMORE, MD. 509 W. Franklin St.
BOSTON, MASS. 79 Milk St.
CHICAGO, ILL. 8 So. Dearborn St.
CINCINNATI, OHIO 141 East Fourth St.
EUCLID, OHIO 21500 St. Claire Ave.
DETROIT, MICH. Penobscot Bldg.

HARTFORD, CONN. 902 Main St.
MINEOLA, L. I., N. Y. 167 Jericho Turnpike
PHILADELPHIA, PA. Real Estate Trust Bldg.
PITTSBURGH, PA. 541 Wood St.
ROCHESTER, N. Y. 48 Berry St.
ST. LOUIS, MO. 604 La Salle Bldg.
WILKES-BARRE, PA. 300 Coal Exch. Bldg.

Sales Agents in Other Cities



Anchor Post Fences

FIRM—because Anchored PERMANENT—because Galvanized

The New Belle Isle Bridge, Detroit

Excluding the cost of the subway under Jefferson Avenue, Detroit, the new Belle Isle Bridge, connecting the automobile city with its playground on Belle Isle, will cost about \$2,500,000. It has required 27 months to build and is 2,200 feet long, this being 428 feet shorter than the old bridge because of the dirt fill on the Belle Isle end. The new bridge is nearly twice as wide as the old bridge, measuring 87 feet against 44 feet for the earlier structure. The old bridge had two 9-foot sidewalks, while the new bridge has two 14-foot sidewalks.

From curb to curb the old bridge was 26 feet, and the new is 59 feet. It measures 30 feet above water-level and the channel, having a rise of 8 feet from the Detroit side to the top of the crown and a drop of 16 feet to the Belle Isle shore. There is a total of 3,018 tons of structural steel and 20,000 cubic yards of concrete in the structure.

The 4,388 feet of attractive railing for the Belle Isle bridge was made by the Stewart Iron Works Company, Cincinnati, Ohio, and sold through its Detroit representative, C. A. Weigel,

2175 Bellevue Avenue. Esselstyn, Murphy and Burns, 3456 Cass Avenue, Detroit, Mich., are the engineers and architects for the bridge.



A NEW TYPE OF LAWN-MOWER THAT WEIGHS ONLY 7½ POUNDS

A New Type of Lawn-Mower

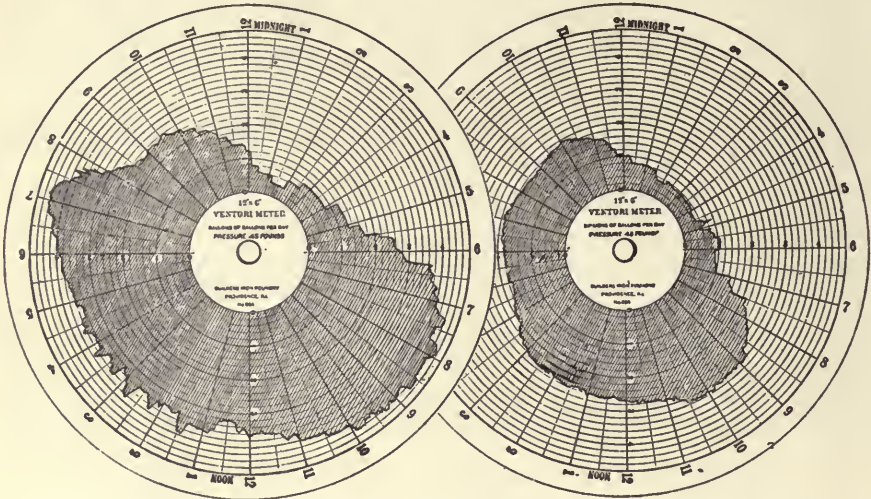
A new type of lawn-mower which weighs only 7½ pounds and which is claimed to be almost silent in operation has been brought out by the Montague Manufacturing Company, 148-154 Lewis Street, Grand Rapids, Mich. When held in the ordinary position, this new machine, known as the MontaMower, cuts the grass approximately one inch long, which is the proper length, according to the government bulletin on the care of lawns.

The cutter consists of two sharp-edged cutting discs which revolve toward each other, slightly overlapping. The grass is gathered in by the cutters and cut off at the intersection of these discs. There are eight groups of cutters, each having a drive-wheel of its own on which the mower runs. All drive-wheels are solidly welded to the main shaft so that all the cutters revolve, even though each wheel does not have traction. The cutters and discs are heavy and have adequate strength to stand up well. New cutters are furnished at about the cost of sharpening an ordinary mower, when the original cutters show wear.



SECTION OF SIDE-RAIL ON BELLE ISLE BRIDGE, DETROIT, SHOWING THE TYPE OF LIGHTING STANDARD INSTALLED

AFTER THE BATTLE



Venturi Charts Which Tell the Story
(Greatly reduced in size)

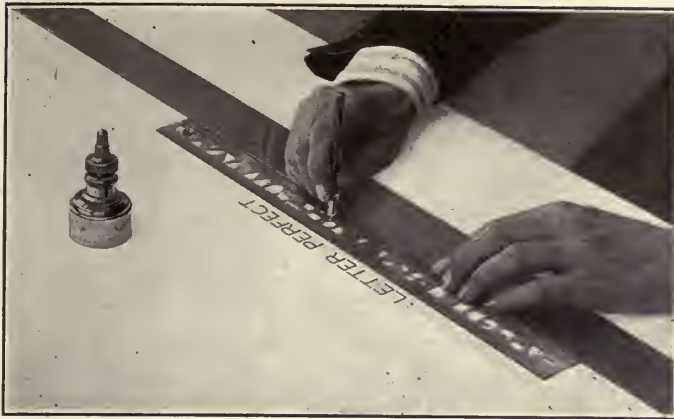
The **BATTLE** between **CONSERVATION** and **WATER WASTE**, if successfully waged, means wise provision against the dreaded period of water shortage.



With **VENTURI METERS** on the main pump and distribution lines, the winning of the battle becomes a practical certainty.

BUILDERS IRON FOUNDRY
PROVIDENCE, R. I.

"Builders of the Venturi for 33 Years"



USING A LETTERING GUIDE MAKES LETTERS PERFECT

A New Lettering Guide

It is difficult, even in these days of great productivity of engineering schools, to find men who can letter rapidly, well and uniformly. In order to make use of men with little training and to produce uniform lettering for engineering work, the Wood-Regan Instrument Company, 154 Nassau Street, New York City, has developed the Wrico lettering guide and lettering pens.

The lettering guide illustrated below in half-size consists of a strip of transparent green Pyralin perforated with various openings, which are readily combined to form all the letters of the alphabet, the numerals and the various symbols. The guide is grooved on the underside so that it may be moved from one character to another without smearing the ink. A separate guide is provided for each size of letter from $\frac{1}{8}$ - to $\frac{1}{2}$ -inch, and each guide except the smallest may be used with four sizes of Wrico lettering pens, giving different bodies to the letters. One particular feature of the guide is the shift button, which, after the first portion of a letter is made, is slid to the end of the shift slot, pressed to the paper, and the guide shifted, bringing the second part of the letter exactly in the right position for completing the letter without delay on the part of the draftsman.

Wrico lettering pens have been designed particularly for use with the guides described above. The pens are made of a special non-corrosive bronze alloy of great strength and wearing qualities. The pens are made in five sizes, four of which may be used with any of the guides except the smallest, which is used only with the fifth pen. The different sizes of pen make it possible for the user to obtain lettering of a considerable range of appearance with each size of guide. The letter-pens are filled in the same manner as ordinary ruling pens, and the flow is regulated by turning the adjusting ring up or down as required. The pens may be easily cleaned by passing a piece of paper between the nibs.

By the use of this lettering outfit, all characters are made uniformly and perfectly. The style is the standard vertical Gothic commonly used by engineering draftsmen, a style that is clean-cut and easily read and presents a pleasing appearance. Very little practice is necessary to operate these lettering guides quickly, and very soon it is possible to letter more rapidly than by

any other method, including free hand lettering. It does away with the disadvantages of guide lines or previous blocking out of letters. All the characters and letters are made complete, so that no retouching or filling in is required. Inasmuch as the letters which have been completed and the outlines of the letter about to be made can be plainly seen through the lettering guide, it is easy to correctly space the letters. Blotting of the work is almost impossible, as the central portion of the guide is raised above the writing surface so that it may be moved without danger of smearing the ink.



Covered Cables for Overhead Construction

The specifications covering spiral-woven or loom-covered cables adopted by the International Association of Municipal Electricians at their meeting September 25-28, 1923, in Reading, Pa., are quite complete. Copies may be secured without charge from the Hazard Manufacturing Company, Wilkes-Barre, Pa.

Briefly, these specifications are for any number of conductors to be insulated with 30 per cent para rubber laid up in cable form, then covered with a tape and spiralweave or loom. The spiralweave or loom is entirely different from the ordinary cotton braids such as are used in the manufacture of insulated wires and cables. It is made of much heavier material and is sometimes called fire-hose weave because of its similarity to the outer covering put on fire-hose.

The advantages of the use of this type of cable are many. All conductors are in one small, compact cable instead of a number of single conductors strung on poles. The cable is light, durable and easy to install. The outer covering is extra heavy and tough and resists wear and tear to a remarkable degree. It is so thoroughly water-



proof as to be almost absolutely water-tight. Maintenance expense is practically eliminated and fire-alarm superintendents' nights are not disturbed by reason of breakdowns during storms and high winds. It is very good for emergency work and can be installed and reinstalled repeatedly and can even be used underground in emergency when lead-covered cable is pulled out and something is needed temporarily.

The best method of installing the cable is to hang it in rings on messenger strands, although some fire-alarm superintendents hang the cable without the use of messenger strands and it has proved satisfactory. The use of the strand not only is the safer, but also makes a much neater and more efficient job.

NEW YORK CITY'S CHOICE of Traffic Signals Milliken Electric "Talking Lamp"



Type "A" Lamp in Central Park, New York City

One of the many installations throughout all five Boroughs of New York City which is giving constant satisfaction and is preventing accidents daily.

The two flashing lenses on each side not only distinguish this from any other light but attract immediate attention and the illuminated glass panels clearly show Police Regulations and road directions both day and night. Refracting lenses also illuminate the column and base—Connection with Street Lighting circuit and six standard electric light bulbs warrant against any possible failure in performance of duty.

Designed for simplicity and economy in operation. Undeniably attractive and artistic in appearance.

Send for full information.

**TRAFFIC SIGNAL
CORPORATION**

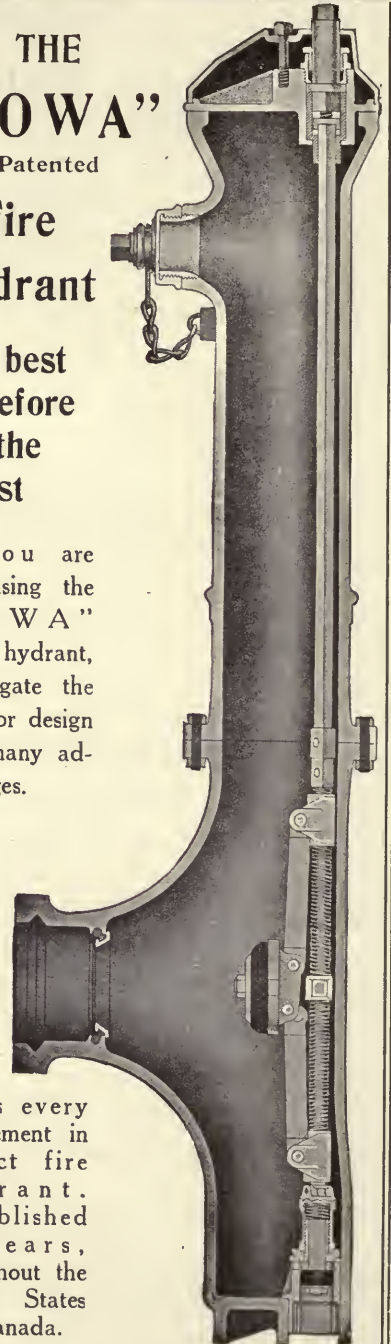
50 Church St., New York City
In Canada

TRAFFIC SIGNAL CORPORATION, LIMITED
9 Richmond Street E. Toronto, Ont.

THE "IOWA" Patented Fire Hydrant

The best
therefore
not the
oldest

If you are
not using the
"IOWA"
fire hydrant,
investigate the
superior design
and many ad-
vantages.



Covers every
requirement in
perfect fire
hydrant.
Established
15 years,
throughout the
United States
and Canada.

Drain Closed

**THE IOWA VALVE
COMPANY**
Oskaloosa, Iowa

Types of Fire Apparatus for Small-Town Service

Local conditions determine the type of equipment that should be purchased to secure maximum fire protection. For towns having a water-works system, with hydrants, which completely covers the town and provides sufficient pressure, the combination chemical engine and hose car equipment is generally recommended. If the water-works system does not provide uniformly good pressure or if it does not cover certain sections where a water-supply, such as ponds, cisterns, etc., is available, a triple-combination pump, chemical engine and hose car equipment is the best. Where there is no water-works system or other supply, a two-, three- or four-tank chemical engine equipment is recommended. The size and type of chassis best suited to the city is governed by the type of fire-fighting equipment with which it is to be combined. Each community has its own set of special conditions which must be studied by competent engineers before any specific recommendations can be made.

The Childs triple-combination pump, single-tank chemical engine and hose car equipment can be secured from the Foamite-Childs Corporation, Utica, N. Y., mounted on any commercial truck chassis. This equipment consists of a steel hose body with slatted wood bottom, capable of holding 1,000 feet of 2½-inch hose. The pump is of the rotary type with suction intakes on both sides, fitted with removable strainers and caps and discharge outlets in each side fitted with 2½-inch brass gate-valves. The pump is equipped with automatic and hand relief valves, pressure gages, and an auxiliary cooling system from pump to motor.

The chemical equipment consists of a stationary tank of 35 gallons capacity complete with a special acid sealing valve, agitator, overflow pipe and wash-out. The rest of the equipment is complete, and well built of good materials, and enables the fire department to readily handle any kind of fire within the limits of the equipment.

Rossiter Moves Office

The Edgar A. Rossiter Company on May 1 moved its offices to 1729 Burnham Building, 160 N. LaSalle Street, Chicago, Ill. This firm of consulting engineers has been in Chicago for over half a century, specializing in water-supply, sewerage and sewage disposal, drainage, farm and levee pumping plants, electric light systems, pavements, track elevation, tunnels and mining.

Road Machinery Company Moves Boston Office

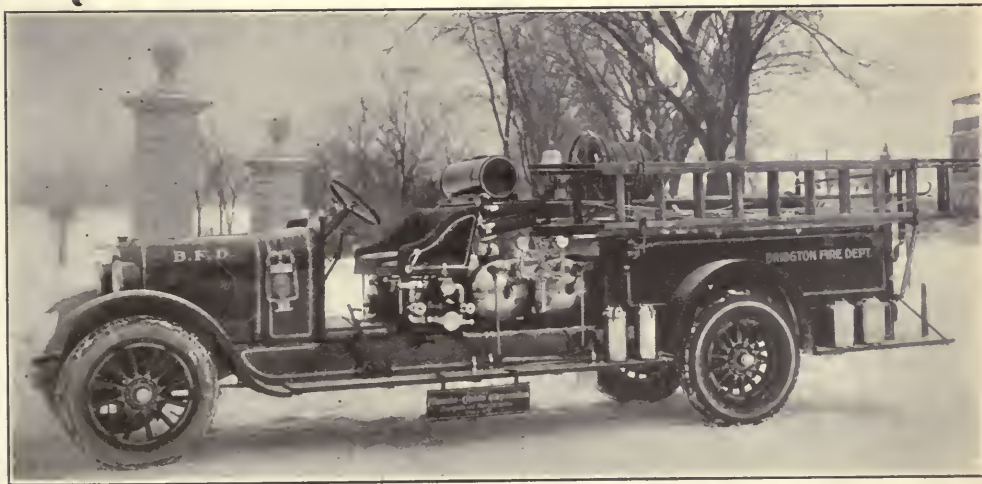
The Good Roads Machinery Company, Inc., Kennett Square, Pa., has announced the removal of its Boston office from 61 Oliver Street to 36 Pleasant Street, Watertown, Mass. At the new location, it has opened an office and a large warehouse which will operate for the better service of the New England trade.

New Chausse Agencies

The Chausse Oil Burner Company, Goshen, Ind., has announced the appointment of the following sales agencies which will handle the sale of Chausse oil-burner tool and surface heaters and contractor's apparatus and salamanders in their respective territories: Bakstad Machinery Company, Peoples Gas Building, Chicago, Ill.; W. B. Spencer, 30 Church Street, New York, N. Y.; The Clark-Wilcox Company, 902 Chapel Street, New Haven, Conn.; Willamette Equipment Company, Portland, Ore.; Willamette Equipment Company, Tacoma, Wash.; Minneapolis Equipment Company, Minneapolis, Minn., and W. F. Cleary Sales Agency, Indianapolis, Ind.

Wire Company Changes Name

The increasing success of Copperweld wire, made by the molten welding process, has been such in the last few years that the name of the wire, "Copperweld," has completely subordinated the name of the manufacturing company, formerly known as the Copper Clad Steel Company. Because of this the name of the company has been changed to the Copperweld Steel Company. Its main office and mills are located at Braddock P. O., Rankin, Pa.



A CHILDS TRIPLE-COMBINATION PUMP, CHEMICAL AND HOSE EQUIPMENT PLACED IN SERVICE IN BRIDGTON, IN FEBRUARY, 1924



G-E traffic signals are the result of a careful study of traffic requirements by G-E illuminating engineers working in conjunction with the police commissioners of leading cities. They have been successful in actual service under varying conditions.

**General Electric
Company**
Schenectady, N. Y.
Sales Offices in All Large Cities

G-E Traffic Signals Distinctive—Effective Reliable

G-E traffic signals meet the needs of modern traffic regulation. The Novalux electric automatic flashing beacon (shown at left) gives a vivid streak of light, at regular intervals, that attracts the eye and flashes a real warning visible at all angles. It is an ideal signal for use in secondary street traffic in large cities and for general traffic in smaller communities.

The Novalux electric automatic signal tower is for heavier traffic. It may be set to operate at any predetermined interval (stopping traffic in one direction and starting it in the other) or it may be manually controlled.

Both of these types of signal are rendered dependable by a new mercury circuit-breaking mechanism which cannot fail through burned out contacts. Uninterrupted service is thus assured.

G-E street lighting specialists have full information on the newly developed line of G-E traffic signals. They can assist in the selection of the type most suited to each traffic condition.



Novalux Electric Automatic Signal Tower—stops and starts traffic at predetermined intervals or may be operated by hand

35C-140

GENERAL ELECTRIC

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

A New Style of Street Sign



NEW TYPE OF
STREET SIGN
USED IN BOSTON

The Century Sign Company, 100 Colonial Road, Boston, Mass., has developed its line of signs made of asphalt, asbestos and cement, with aluminum letters, and has brought out the sign illustrated, for use on trolley posts or ornamental lighting standards.

This type of sign has been installed in several places in Boston, where they have been attached to electric light poles at corners of streets. Instead of the familiar horizontal sign, the letters are arranged vertically. The aluminum letters on the black background take the place of the gilt letters on a sanded background. These new signs are very ornamental. In the Boston signs, at the top is the seal of the city carved in the metal and standing out in bold relief, and the bottom of the sign is also ornamented.

A New Rubber Paving

Early in 1924, the Goodyear Tire and Rubber Company, Akron, Ohio, paved with rubber blocks a section of the street fronting its plant. These rubber blocks resemble common paving bricks in size and shape, with the exception of a tongue-and-groove construction on two sides which joins the blocks together in a close union. The bottom of the blocks and the wearing surface are smooth. With the ends and grooved sides dipped in a hot tar compound to form watertight joints, the blocks are laid on a concrete base and covered with a coating of the tar compound.

The Goodyear Company received permission from the Akron City Council to lay this section

to test rubber block paving compounds and construction, as well as to determine the wearing effect of traffic upon the blocks themselves. A section 10 x 12 feet was laid in the street directly in front of one of the factory entrances where loaded trucks passing in and out will give the paving a thorough try-out. The purpose of rubber block paving is twofold. First, it reduces the traffic vibration found in other pavements, thus protecting the mechanism of vehicles riding over it, and on bridges it is said to be the means of cutting down on the steel work required to withstand vibration. It also minimizes the crystallization of the steel, because the rubber takes up part of the shock created by traffic. Second, rubber blocks reduce traffic noises and are expected to prove useful in hospital quiet zones, apartment courtyards, station platforms and other places where trucking and travel is considerable.

A New Traffic Control Device

The development of motor traffic has brought about one of the most difficult problems that city officials have to face. The increasing speed and number of motor vehicles have made it necessary to regulate traffic at more and more points, and the expense of detailing traffic officers has become very serious. This situation has brought forth many kinds of mechanical traffic regulators, two of the latest of which are manufactured by the Griswold Safety Signal Company, 414 Plymouth Building, Minneapolis, Minn.

The American Bobby danger signal is a narrow, vertical shaft which may be mounted between street-car tracks, or at any other point, without taking up very much space. The feature of both the American Bobby danger signal and the traffic regulator is that when it is struck it yields to the blow, and the car may pass over it uninjured. A collision that would smash a stationary signal, possibly wreck the car and injure the occupants, harms no one when the American Bobby is used. Severe tests were made of this signal before putting it on the market.

The danger signal is equipped with a red light at the top, which burns continuously, throwing out its warning directly in the line of vision of motorists. The traffic regulator illustrated gives alternate "Stop" and "Go" signals, the control being operated from a steel cabinet at the curb and



INSPECTING THE NEW RUBBER ROAD LAID BY THE GOODYEAR COMPANY

ADLAKE
Electric
FLASHING
Highway
SIGNAL

***This Flashing Signal Cuts
Maintenance Costs***

The ADLAKE Electric Flashing Highway Signal is built to operate for more than a year on one set of primary batteries, servicing and upkeep costs being practically eliminated.

No outside source of current is required. All working parts are self-contained. Economical first cost and installation combined with low maintenance cost, are big factors in ADLAKE popularity in cities, villages and on the highways.

Write for Descriptive Literature

The Adams & Westlake Company
CHICAGO

NEW YORK

PHILADELPHIA

consisting of a flasher similar to those used for many years in electric signs.

The vertical shaft of these signals is mounted on a cast steel ball which is held in place by oil-tempered equalizing springs and tension springs. When rocked, the steel ball turns on crucible steel bearing wheels, permitting quick return to its normal vertical position.

Fire Engine Manufacturers Change Name

The Prospect Manufacturing Company, Prospect, Ohio, well known as manufacturers of Deluge rotary fire pumps and motor apparatus for the last twelve years, has changed its name to the Prospect Fire Engine Company. This change brings the name of the company more in line with its work, as its efforts in the past years have been confined exclusively to the manufacture of fire apparatus.

There is no change in officers nor in the administration of the company, except in the name, which is felt to be more suitable to the business being conducted.

New Locked Cistern Top Real Life-Saver

The Yaeche locked cistern top is a Clark product of interest to a large group of municipal officials. This cistern top, made by the H. W. Clark Company, Mattoon, Ill., is most appreciated in localities where they have had many casualties through the use of loose, unlocked cistern, cesspool and vault covers. A great many children have lost their lives by falling into these holes when not fully protected. The Yaeche top has a special lock operated by a handle in the center which is protected by a cover when not in use. These covers insure clean cistern water because



THIS SIGNAL CAN'T BE KNOCKED DOWN

they cannot be meddled with, and are also excellent for coal holes in sidewalks. The cover has a 20-inch opening, measures 27 inches over all, and is well made, so that it will make a permanent installation.

New Motion Pictures About Sewers

What proper sanitation means to a community, and what salt-glazed clay pipe means in constructing sewers that will produce ideal sanitation, is to be put before the public by means of a motion picture. The Clay Products Association, 133 Chamber of Commerce Building, Chicago, Ill., through its Secretary, George C. D. Lenth, engaged the Atlas Educational Film Company, Oak Park, Ill., to make the picture, which will soon be released.

Thus salesmen for manufacturers in the Association will have two reels of film to exhibit in exploiting their product. One reel sets forth the properties of clay and the manufacture of salt-glazed clay pipe. The other explains the necessity for proper sanitation and the part salt-glazed clay pipe plays in the construction of adequate and indestructible sewers.

The reel having to do with sanitation is called "That Matter of Health." It explains that ancient Babylon and Nineveh decayed largely because of improper sanitation. Animated drawings show the contamination of wells by cesspools and sewer catch-basins, improperly constructed. Pestilence, the film shows, followed in the path of these conditions. That such situations still exist in various communities is then pointed out, with trick photography employed to show how outhouses and barns contaminate fresh-water wells.

How engineers solve these problems, the difference between storm, industrial and domestic sewers, and the necessity for constructing sewers to serve not only immediate needs but future demands, all follow in the next scenes. That salt-glazed clay pipe is unaffected by acids and alkalis in sewerage or in the soil is then emphasized with many illustrations. This point is further stressed by showing a chemist at work in a ceramic laboratory where he tests salt-glazed clay pipe with hydrochloric acid and finds that the glass surface of the pipe is not affected by the acid.

The second part is "The Romance of Clay," and shows the formation of the earth according to the spiral nebular theory, the creation of clay deposits, the indestructibility of clay and fineness of the particles, and the mining of clay.

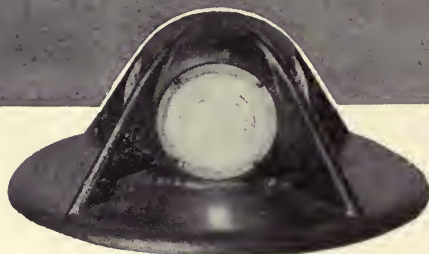
How salt-glazed clay pipe is manufactured is then pictured, with the vitrifying process, within the kilns in detail. Various sizes of the finished pipe are shown,



LOCKED COVERS PREVENT ACCIDENTS



Attention
Compelling



Respect
Compelling

Not a Device But a System

STREET traffic cannot be effectively controlled by "trick" devices, different in design and type on every corner. Like all other forms of traffic it should be directed by a coherent, logical system. Traficons provide such a system, a system so simple that a touring motorist can come into your city and drive about without violating traffic rules. The designers realized that no single device is equal to all conditions of traffic, so they created three simple units:

The Directing Traficon

(pictured above) to show traffic *where to go*, intended for intersections where the volume of traffic requires only a warning signal.

The Regulating Traficon

to show traffic *when and where to go*, intended for intersections, requiring the supervision of an officer.

The Zone Marker Traficon

to mark off safety islands, car boarding areas, parking zones and the like. Each of these units is complete in itself, but the installation of all three types assures a definite and uniform system of control.

Booklet

Let us send you a 12-page booklet in colors, explaining and illustrating Traficons and Traffic Control.

TRAFICONS

Made by Traffic Control, Inc., Milwaukee, Wis.

A System for the Safe and Expeditious Handling of Traffic

LINE MATERIAL CO., South Milwaukee, Wis.

and its use in modern homes with proper sewer connections is contrasted with the conditions in those residences where proper sewer connections are lacking.

Hazard Moves Chicago Office

On May 1 the Chicago office of the Hazard Manufacturing Company, Wilkes-Barre, Pa., was moved to 32 South Clinton Street, Chicago, Ill. Prior to that time it was located at 552 West Adams Street, Chicago.

Two New Types of Traffic-Regulating Signals

After careful and exhaustive study of the various phases of the traffic problem and after long continued experimentation, the General Electric Company, Schenectady, N. Y., has developed two types of traffic-regulating signals. One is a flashing beacon which operates automatically and flashes on and off once per second. This unit is for use on secondary streets where it is desired to mark dangerous intersections or blind corners, on highways to give warning of the proximity of cross-roads or intersecting branch roads, at dangerous curves or grades, and at railroad crossings. The flashing beacon consists of a lighting unit installed on the top of a pipe rising from a concrete base to an over-all height of 8 feet 9 inches. The pipe is equipped with arrows or a box type sign on which may be printed any warning or direction desired. The lighting unit is a 23-watt, 110-volt clear Mazda lamp railroad type, mounted in a nest of silvered reflectors, so arranged as to give to the light the appearance of a vertical streak as it flashes on and off. It is enclosed in glass, making it water-proof. Through the glass at the bottom, light falls around the base of the standard, illuminating a circle several feet in diameter and making the signal clearly visible against the dark background. The unit is designed for operation both day and night. The flasher is operated by an alternating current motor which consumes 4 watts. With the lamp load this makes a yearly load of approximately 200 kilowatt-hours, if the unit is operated continuously on a 24-hour schedule. When installed at street or highway intersections, the unit can be tied into a 110-volt multiple circuit, or power can be taken from a series circuit by the use of an IL transformer. The latter arrangement is not, of course, feasible if the unit is to be operated by day as well as by night.

The other new unit, the Novalux automatic electric traffic signal tower for heavy traffic control, is intended for use at street intersections where travel is heavy both day and night. It is designed for automatic operation, but may be manually operated if desired, the changes being made in that case by the use of switches. The unit operates upon a multiple 110-120-volt circuit and a 24-hour schedule. The operating mechanism which, in this device as in the flashing beacon described, consists of a motor and mercury tubes, is contained in a weather-proof box at the base. The complete device is made up of two, three or seven lighting units on each of its four faces as desired, each complete in itself, but working in conjunction with the others. These units are mounted on a tower or post, the over-all height being approximately 15 feet. Each unit contains

a single lamp in its center, the light from which is concentrated through the lens by means of the glass reflector.

In the two-section combination, one section has four red and the other four green lamps, one on each face. Thus, when green, giving the right of way, shows up and down the street, red, stopping traffic, shows both ways in the cross-street. When the mechanism changes, the lights are reversed and the flow of traffic starts in the other direction.

The three-section combination adds a third section between the other two which shows amber on all four sides. This flashes on at any interval desired before the red and green are about to change, giving warning to drivers that the right of way is about to change, besides stopping traffic and providing a clear path for pedestrians.

The seven-unit type consists of four letters on each face with four sets of red lenses which spell out the word "Stop," reading from the top downward. The fifth section is the amber "Change" warning signal, and the sixth and seventh are green lenses with the letters "Go" on them and similar to the "Stop" of the upper four. Each letter in the four upper and two lower units is, as indicated, lighted by an individual lamp; and as wide-angle glass is used, the signs may be read at a great distance in brilliant sunlight and also at short range at a wide angle.



AN ELECTRIC FLASHING TRAFFIC SIGNAL WHICH ILLUMINATES THE PAVEMENT AND ALSO THE BASE OF THE SIGNAL

What is the Ideal Height for a Lighting Standard?



HOLLOWSPUN reinforced concrete lighting standards are made in a variety of sizes to meet any ordinary requirements. So we have no preference for any one size.

As independent observers, however, we cannot help noting the tendency toward increased mounting height. The installation pictured, at Chicago Heights, Illinois, uses a 15-ft. standard in a business and semi-business district having no high buildings. Some prefer the 12-ft. or 13-ft. height, but this is typical of the trend among lighting engineers and municipal authorities who formerly favored the 8-ft. or 10-ft. standards.

The principal arguments advanced by the advocates of these higher standards include:

- 1 A reduction in glare as the light source is raised.
- 2 Economy, as the spacing is increased, and the number of units correspondingly decreased.
- 3 Greater efficiency, as the higher candle power lamps used to get the same intensity with greater spacing are more rugged.

Our catalog supplement No. 9 has just been revised to show a large number of recent installations. The trend of current street lighting practice, as indicated in the new supplement, No. 17, will interest you. May we send you a copy?

Massey Concrete Products Corp.

PEOPLES GAS BUILDING

CHICAGO, ILL.

HOLLOWSPUN LIGHTING STANDARDS

Vol. XXX
No. 6

The American City Magazine

JUNE
1924

443 Fourth Ave.
NEW YORK

50 Cents
\$4 a Year

Now Ready: The First Edition of an American Municipal Yearbook

IN every one of the more than 16,000 incorporated places throughout the United States are to be found municipal officials and public-spirited citizens who are planning and working for civic advance. The American people are coming more and more to realize that, in times of peace, the governmental activities which most directly affect their welfare and happiness are those of their local communities.

As a result, the cities, towns and villages of America are not merely becoming better places in which to live and work and play, but are serving as proving-grounds for still further progress in municipal improvements and civic advance. Important forward steps here, and doubtful experiments there, are being watched by other communities in a spirit of appraisal and healthy emulation. We are seeking to do everywhere—or at any rate elsewhere—what has proved its value somewhere.

This growing interest in local progress has been partly the effect and partly the cause of a widening demand for information as to standards, methods and equipment for the planning, building and governing of modern cities. Through the monthly issues of THE

AMERICAN CITY and other sources, this demand has been increasingly met. But there has not heretofore been available an annual compendium of information such as is now presented in the first edition of *The Municipal Index*.

This new yearbook has been compiled and edited by the publishers of THE AMERICAN CITY, with certain groups of users and certain purposes especially in mind. No attempt has been made to produce a popular treatise. It has been assumed that the book will be read and consulted mainly by municipal and county officials and department heads, and by civic organizations, city planners, consulting engineers, landscape architects and other specialists who,

through leadership or advice, are influencing the destinies of American cities. For such *The Municipal Index* will prove, it is believed, of great value as a handbook of information.

In the 408 pages of the 1924 edition will be found more than 148,000 words of text matter (exclusive of 261 pages of abridged catalogs) on the subjects covered by the seventeen main divisions here listed. There are also more than 9,500 words descriptive of the activities and services of 114 national organizations and

The Municipal Index: 1924

A bound volume of 408 pages of authentic articles, bibliographies, alphabetical and classified lists, and abridged catalogs, grouped into seventeen main divisions, as follows:

Administration—Government—Finance
City and Regional Planning, Housing and Zoning
Fire and Police Departments
Garbage, Ashes and Rubbish—Collection and Disposal
Motor Trucks in Municipal Departments
Parks—Playgrounds—Trees
Power-Plant Equipment and Operation
Public Health—Public Welfare—Public Education—Public and Community Buildings
Public Utility Ownership and Regulation
Sewers, Sewerage and Sewage Disposal
Street and Highway Lighting
Street Cleaning and Snow Removal
Street Construction
Traffic Control and Facilitation
Water-Supply and Purification
Municipal Aids from Uncle Sam
National Organizations Serving Municipalities

Price, \$4.00 postpaid

25 Government bureaus serving municipalities. The bibliographies contain more than 1,100 entries; the alphabetical list of subjects, 675 entries; and the classified list of products and services, 943 entries under 375 headings.

Notwithstanding the large amount of information which has been included within the covers of this new yearbook, it is obvious, of course, that no such compendium can meet

every need of every user. The publishers invite suggestions as to how future annual editions can be made more valuable; and they will endeavor to answer, without charge, inquiries from users of *The Municipal Index* who do not find in it data or references to sources of information on subjects relating to municipal or county improvements in which they are especially interested.

Civic Responsibilities of Summer Resorts

THE annual exodus from the cities to the coast and mountain and country villages is upon us. Thousands of small communities, during these summer weeks, will play host to millions of guests from the larger municipalities. To what extent shall the two-weeks or two-months vacation of these visitors pay dividends to them, not merely in immediate enjoyment, but in added health and vigor?

The answer depends, of course, partly on the guests and partly on the hosts, both individual and municipal. The vacationist has himself—or his companions—to blame if he spends in dancing or mah jong time that might be more profitably spent in the great outdoors. Or, if a sedentary worker, he may have misguided enthusiasm to blame if he goes to the other extreme and overtakes his strength with too much exercise.

But failure of the vacationist to benefit as he had hoped from his annual escape from his city surroundings is too often due to the fact that he has actually come to an environment less healthful than the one which he left. Most of our cities are now providing their people with a water-supply far safer to drink than that which is poured from the old oaken bucket, or even that which flows unsterilized from many a small-town reservoir. Most of

our big city boards of health are inspecting and safeguarding their milk and food supplies to a degree unknown in many a community where it is still naively supposed that country dirt is always clean dirt.

The fire risk, too, is often far greater in the country hotel or boarding-house than in the home from which the city dweller came. The street on which that home faces is apt to be more free from dust—and even, perhaps, more beautified by shade trees—than the village street to which his summer wanderlust will bring him. The traffic regulation and street lighting, also, in his home town may make driving safer there than through the village square.

And so the summer resort community, as a municipality, has a very distinct responsibility, not only to its own citizens but to the visitors who provide so large a share of its material prosperity. Here, as elsewhere, good business and good civics walk hand in hand; for the city dweller, in selecting his country home or his vacation resort, is beginning to ask not merely whether there are fish in the lake, but whether there are typhoid germs in the water-supply—not merely whether there are birds in the trees, but whether there are flies in the kitchen.

Relation of Housing to Health

OUR English contemporary, *Garden Cities and Town Planning*, publishes in its May number the following information to illustrate the effect of good and bad housing on health: The comparative figures are for London and the nearby garden city of Letchworth, and for Birmingham and its garden suburb of Bournville.

	Total Death-Rate per 1,000 Population (1922)	Infantile Death-Rate per 1,000 Births (1922)
London	13.5	75
Letchworth	8.4	66
Birmingham	12.1	77
Bournville	8.3	54

Of the total number of deaths in Letchworth in 1922, namely, 97, it is stated that 22 were of

people over 70 years of age, 7 over 80, and 3 over 90.

The following comparison of physique between an elementary school in Bournville and an elementary school in one of the most overcrowded wards of Birmingham are of considerable importance:

Boys:		Weight—aged 6			
Bournville	45.0	52.9	61.6	71.8	lb.
Floodgate St.	39.0	47.8	56.1	63.2	"
Girls:		Weight—aged 6			
Bournville	43.5	50.3	62.1	74.7	"
Floodgate St.	39.4	45.6	53.9	65.7	"
Boys:		Height—aged 6			
Bournville	44.1	48.3	51.9	54.8	in.
Floodgate St.	41.9	46.2	49.6	52.3	"
Girls:		Height—aged 6			
Bournville	44.2	48.6	52.1	56.0	"
Floodgate St.	41.7	44.8	48.1	53.1	"



NINE-HOLE MUNICIPAL GOLF COURSE AT BEARDSLEY PARK, BRIDGEPORT, CONN.

Municipal Golf in a Hundred Cities

By Rebecca B. Rankin

Librarian, New York Municipal Reference Library

GOLF has become a favorite sport of the Americans. It has been estimated that private golf clubs number 2,800 or more, and that fully 400,000 play on these courses. The spread of this interest accounts for the fact that municipalities have felt the urge to provide municipal golf courses for their citizens. However, the actual provision of public golf courses has not been as great as perhaps might be supposed.

A survey of the principal cities of the United States made by direct questionnaire reveals the number of golf courses now in use or under construction. It is difficult to secure authoritative information. We have used all sources of information; the survey forms the basis of the summary; added to that are facts that have been gleaned from all published reports of parks and recreation agencies in cities, and from other surveys, as that

by the Toledo Commission on Efficiency and Publicity in 1923, from printed articles, and from persons conversant with municipal golf. From the whole, we have compiled the following summary concerning municipal golf. The same facts, as nearly as possible, are given about each city, all stated clearly and briefly.

Each city has its individual method of keeping records, and there is little uniformity. It is impossible to make many definite summarizations or to give total amounts. They show that there are 140 municipal golf courses in 100 cities. There is an average acreage of 90 to a course. The size of the links varies greatly; some cities have 90 acres for a 9-hole course, and others only 25 acres for 9 holes; 18-hole courses run as large as 175 acres, while some are only 90 acres.

There is likewise a great variety in the fees charged for municipal golf. A number of

cities furnish this sport free of charge. Some cities charge per game or round; this varies from 10 cents to 50 cents. Others charge by the season, month or day, the usual amount being \$10 a season, \$2 per month, or 50 cents daily. Others have no season rates at all, but charge every player by the day, 25 cents to \$1 daily. Some cities make a difference in rates charged to men and women—not many, however. The majority of the municipal courses make a small charge; of the total number only ten allow their courses to be used free.

Almost every city furnishes golf houses which are free to patrons of the course, though in most cases locker charges are made—a nominal sum, sometimes \$1, up to \$10. Practically all cities have a professional golfer on the course who will give instruction if desired. Caddies are also provided; in some cases there is no extra charge for caddy service.

It is interesting to note that in a good many cities it has been found advantageous to have clubs, even on the public golf courses. These clubs have been organized as purely social organizations. A person may join or not, as he wishes. Such a club in connection with a municipal golf course increases its popularity and is to the advantage of all who use the course. No advantages are granted members, but these clubs do much to keep the morale of the players to a high standard, and help to

enforce rules, and they are also a means of securing for players reciprocal privileges with private clubs.

Summary

ASBURY PARK, N. J. (Department of Revenue and Finance).—One course, 18-hole; 10,000 or more players annually; fee, \$2 per day. Club house. Caddies provided or brought; professional instructor. Acreage, 100. Annual maintenance, \$18,000.

ATLANTA, GA.—Two courses; fees, 25 cents a day; 55,000 players annually.

AURORA, ILL. (Department of Parks).—One course, 9-hole, 110 acres, just constructed; no registration statistics available; managed by Superintendent.

BALTIMORE, MD.—One course; fees, none; 600 players per day.

BARBERTON, OHIO.—One course.

BOSTON, MASS. (Park Department).—Two courses, 18-hole and 6-hole; 20,000 players annually; registrants average 890 daily; annual season permit to citizens \$10; green fee, \$1 per day to those without annual permit. Golf house; 600 lockers, 9 shower-baths, checking facilities; \$2 rental per year for locker. 50 caddies, paid by players using them; professional instructor. Acreage, 125. Golf club—Scarboro Golf Club.

BRIDGEPORT, CONN. (Park Department).—One course, 9-hole; 33,000 players annually; \$3 per year for women, \$4 for men, 25 cents a day for transients. Club house. Caddies, 25 cents a round; professional instructor. Annual maintenance \$5,000.

BUFFALO, N. Y. (Department of Parks and Public Buildings, Bureau of Recreation).—Two courses, in Delaware Park and South Park—18-hole and 9-hole respectively; 6,500 golf permits issued in 1922; no fees. Club house with lockers. Caddies provided or brought; instructor. Acreage, 100 in Delaware Park, 60 in South Park. Annual maintenance, \$20,000.

CANON CITY, COLO.—One course.

CHICAGO, ILL. (West Chicago Park Commissioners).—Two courses, one in Garfield Park and one in Columbus Park—9-hole; 58,330 men, 14,101 women players in Garfield Park; 56,868 men and 18,397 women in Columbus Park in 1923; fees for each game 15 cents and 20 cents for future registration. Lockers and lunchroom. No caddies or instructor. Acreage, 20.8 in Garfield, 64 in Columbus Park. Annual maintenance, \$13,000 per course.



Courtesy of The Playground

MUNICIPAL GOLF COURSE IN GOODWIN PARK, HARTFORD, CONN.



THE NO. 13 GREEN ON THE HILLS GOLF COURSE, DAYTON, OHIO

(South Park Commissioners).—Three courses, two 18-hole and one 9-hole; players on 18-hole course in Jackson, 124,589 in 1922 and 117,570 on 9-hole course; Marquette Park players, 100,087; fees, 15 cents per game or 20 cents for future registration per game. Shelter building with lockers. No caddies or instructor. Acreage, 88 in Jackson Park, 18-hole course; 9-hole course, 31; Marquette Park, 18-hole, 129. Annual maintenance, three courses, approximately \$20,000.

(Lincoln Park Commissioners).—One course, 9-hole; 108,047 players, 1923; 15 cents for 9 holes. Club and club house. Acreage, 70. Annual maintenance, \$23,000. (Forest Preserve District of Cook County).—Palos Golf Course, 18-hole; Edgebrook Golf Course, 9-hole.

CINCINNATI, OHIO (Board of Park Commissioners).—Two courses, 18-hole and 9-hole; 650 players annually; fees \$10 per year. Club house being erected. Caddies; instructor. Acreage, 114 for 18-hole and 30 for 9-hole. Golf clubs bear expense of maintenance.

CLEVELAND, OHIO (Department of Parks and Public Property).—One course, 18-hole; an additional 9 holes ready this month; 80,000 players; greens fee, 25 cents; caddy charge, 45 cents for 9 holes, 80 cents for 18 holes, extra holes 5 cents extra. Club house, leased and operated by Highland Park Golf Club. Acreage, 400. Annual maintenance, \$26,000.

COLUMBUS, OHIO (Department of Public Recreation).—One course, 9-hole; 20,511 players in 1922; 285 members; membership fee, \$15 for men, \$10 for women; 75 cents per day; caddies, 35 cents a round. Acreage, 80. Club and club house. Annual maintenance, \$9,000.

CROOKSTON, MINN.—One course.

DALLAS, TEX. (Park Board).—One course, 18-hole; opened May 3, 1923; 150-200 players daily; \$10 per year, or 50 cents for greens fee. Caddies provided or brought; professional instructor. Acreage, 120. Estimated maintenance, \$10,000. Club house under construction.

DAYTON, OHIO (Department of Public Welfare).—Two courses, 18-hole; 67,700 players in 1922; \$10 a year to men, \$5 to women, 60 cents a day for guests; water tax, \$2 per year to men, \$1 to women. Caddies provided or brought; professional instructor and club house. Acreage, 250. Annual maintenance, \$10,500.

DENVER, COLO.—One course; 60,000 players annually; \$6 per year or 50 cents a day.

DES MOINES, IOWA (Department of Parks and Public

Property).—Two courses, 18-hole; 300-800 players daily, 49,000 a year; 25 cents a day or \$5 per season. No caddies; no instructor. Acreage, 300. Annual maintenance, \$14,000.

DETROIT, MICH. (Department of Parks and Boulevards).—One course, 9-hole; 56,000 players annually; fee, 25 cents. Caddies; instructor. Acreage, 38. Annual maintenance, \$8,000.

DULUTH, MINN.—Land purchased; expect to build in 1924.

EAU CLAIRE, WIS.—One course.

ELGIN, ILL. (Department of Public Property).—One course, 9-hole; 20,000 players annually; no fees. Club house—Wing Park Golf Club. Acreage, 25. Annual maintenance, \$2,000.

ELMIRA, N. Y. (Elmira Community Service and City Recreation Commission).—One course, 7-hole. No club house; Eldridge Lake Golf Club just organized. No caddies. Maintenance for first year, \$800.

ERIE, PA.—One course.

EVANSVILLE, IND.—One course, 18-hole; just purchased. Acreage, 400.

FERGUS FALLS, MINN.—One course.

FLINT, MICH.—One course.

FORT WORTH, TEX. (Public Recreation Board).—One course, 18-hole; 10,062 games during first 60 days of operation; fee, 25 cents, 9 holes, \$2 per month, \$12 per year. Club house. Caddies; professional instructor. Club in process of organization. Acreage, 107½. Annual estimated maintenance, \$9,000.

HARRISBURG, PA.—One course.

HARTFORD, CONN. (Department of Parks).—One course, 18-hole; 30,000 players annually; fee, 10 cents every 9 holes. Club house, lockers, single, \$5, double, \$6. Caddies. Acreage, 90. Annual maintenance, 1922, \$5,634.41.

HOUSTON, TEX. (Park Department and Committee of Citizens).—One course, 18-hole; 100 players daily; fee, 25 cents for 9-holes. Club house. Caddies; professional instructor.

HUNTINGTON, PA.—One course.

INDIANAPOLIS, IND.—Four courses; 182,000 players annually; fees, 25, 50 and 75 cents. Annual maintenance, \$26,029.

JACKSON, MICH. (Trustees of Ella W. Sharp Park



GOLF AT RECREATION PARK, LONG BEACH, CALIF.

Fund).—One course, 9-hole; 1,110 players Sept. 22-Nov. 28, 1923, 1,023 players April 16-May 10, 1924; fees, 25 cents first 9 holes, 10 cents for second if started within 2½ hours. Club house in construction. Caddies brought. Acreage, developed 38, undeveloped, 50. Maintenance, none.

JACKSONVILLE, FLA. (City Commission).—One course, 18-hole; fees, 50 cents per day, \$10 for 30 days used any time within year. Club house. Caddies provided or brought; professional instructor. Acreage, 146. Annual maintenance, \$10,000.

JACKSONVILLE, ILL.—One course.

JEFFERSON CITY, Mo.—One course.

KANSAS CITY, Mo. (Park Board).—One course, 18-hole; 15,000 players annually; fees, 50 cents per day, \$2 per month, \$10 per year. Club house. Caddies provided or brought; instructor. Acreage, 180. Annual maintenance, \$15,000.

KENOSHA, WIS. (Park Department).—One course, 9-hole; 23,645 players in 1923; fees, 15 cents per round. No club house; Kenosha Golf Club; lockers, \$4 per season. Caddies; professional manages course. Acreage, 42. Annual maintenance, 1923, \$3,600.

KNOXVILLE, TENN.—One course.

LAKE CITY, MINN.—One course.

LANCASTER, PA.—Two courses.

LANSING, MICH. (Park Board).—18-hole course under construction; fees will be charged. Acreage, 120.

LARAMIE, WYO.—One course.

LEBANON, OHIO.—One course.

LINCOLN, NEBR.—One course, 18-hole; fees, 25 cents per day, Sunday 50 cents per round. Annual maintenance, \$6,500.

LONG BEACH, CALIF. (Recreation Department).—One course, 18-hole; 148 players daily; fees, 50 cents per



MOWING A GOLF COURSE WITH A HOLT CATERPILLAR TRACTOR

day, \$4 per month, \$12 for six months, \$20 per year. Club house. Caddies; professional instructor. Acreage, 90. "We make about \$10,000 a year."

LOS ANGELES, CALIF.—One course; 100,288 in 1922; fees, 50 cents per day, \$10 per year. Monthly maintenance, about \$2,000.

LOUISVILLE, KY.—One course, 18-hole; 54,000 players annually; fees, adults, 25 cents per day, \$10 per year, children, 15 cents per day, \$5 per year. Professional instructor, caddies and club house. Caddies; professional instructor. Acreage, 100. Annual maintenance, \$10,000.

MEMPHIS, TENN. (Park Department).—Two courses, 9 holes each; registrants, 1922, 8,378; no fees. Caddies. Acreage, 135. Annual maintenance, \$8,000.

MIDDLETOWN, OHIO.—One course.

MILWAUKEE, WIS.—Three courses; 40,000 players annually; no fees. Annual maintenance, \$14,000.

MINNEAPOLIS, MINN. (Recreation Department of Board of Park Commissioners).—Two courses, both 18-hole; 117,417 players annually. Columbia Golf Course has locker rooms and office accommodations, 25 cents per round. Glenwood Golf Course has golf building, clubs, showers, lockers, 40 cents per round. Caddies; instructor. Acreage, approximately 200. Annual maintenance, Glenwood Course, \$10,510, Columbia Course, \$5,961.

NASHVILLE, TENN. (Park Board).—One course, 9-hole.

NEWARK, N. J. (Essex County Park Commission).—One course, 9-hole; 60,178 players in 1922, 1,764 seasonal permits, residents, 67 seasonal non-resident permits, and 58,347 daily permits; fees, \$2.50 for residents of county, \$5 for non-residents, 25 cents daily for residents and 50 cents for non-residents. Field house; Weequahic Golf Club. Caddies provided or brought. Acreage, 60. Annual maintenance, \$8,811.18.

NEW ORLEANS, LA. (Board of Commissioners of City Park).—One course, 18-hole; 24,509 players, 1922; fees, 35 cents per game. Club house in upper floors of Park Casino; lockers \$4 per year. Caddies; instructor. Acreage, 85. Annual maintenance, \$9,000.

NEW YORK CITY, N. Y. (Bronx Department of Parks, Borough of Bronx).—Three courses, 18-hole; 900 players daily; fees, \$10 per year to residents, \$20 to non-residents, daily, \$1 to all. Lockers. Caddies; professional instructor. Total acreage, 246. Annual maintenance, \$48,000.

Brooklyn (Department of Parks, Borough of Brooklyn).—Two courses, one public, one semi-public; 9-hole and 18-hole; 2,400 players annually; fees, \$1 per season, 75 cents and \$1.50 daily. Caddies.

Queens (Department of Parks, Borough of Queens).—One course, 18-hole; 2,500 players annually, registrants annually, 5,800; fees, annual \$10, daily permits, \$1. Club house; lockers, for one, \$10, for two, \$15, and three, \$20. Caddies; professional instructor. Acreage, 118. Annual maintenance, \$12,351.04.

NORFOLK, VA. (Director of Public Welfare).—One course, 9-hole, just constructed; fee, 15 cents for 9 holes. Club house under construction. Caddies brought; professional instructor. Acreage, 65.

OAKLAND, CALIF.—18-hole course under construction.

OKLAHOMA CITY, OKLA.—One course.

OMAHA, NEBR. (Recreation Department).—Three courses, one 18-hole, two 9-hole; 2,000 annual permits, 12,000 daily permits; fees, \$2.50 annual permit, 25 cents daily. Caddies; instructor. Acreage, 250. Annual maintenance, \$14,800.

OSHKOSH, WIS. (Park Board).—One course, 9-hole; 8,060 players in 1923; fees, 25 cents per half-day; revenue from players, \$2,015. No club or club house; small shelter house. Caddies brought; professional is the park-keeper. Annual maintenance, including park-keeper, \$1,200.

PEORIA, ILL.—One course.

PHILADELPHIA, PA. (Commissioners of Fairmount Park).—One course, 18-hole; 80,000 players annually, 5,560 annual permits (1922); fees, \$3 annual playing permit, \$10 annual locker charge, 50 cents daily permit. Club house; lockers; showers. Caddies provided or brought; professional instructor. Acreage, 120. Annual maintenance, \$25,000.

PITTSBURGH, PA. (Department of Public Works, Bureau of Parks).—One course, 18-hole; 3,154 players, 1922; fees, \$10 per season locker and playing permit, playing permit without lockers, \$3, 50 cents daily. Two locker houses; showers, etc. Caddies; instructor. Acreage, 90. Receipts, 1922, \$14,264.00; expended, \$9,500.

PORTLAND, ORE. (Bureau of Parks).—Two courses and one under construction, one 18-hole and two 9-hole; 75-

000 players on 18-hole course; fees, 25 cents for 9 holes, 40 cents for 18 holes. Club house leased to concessionaire. Caddies provided or brought; instructor. Acreage, 305. 18-hole course maintenance, 1922, \$14,000.

PORTSMOUTH, VA.—One course.

PROVIDENCE, R. I.—Course under consideration.

RACINE, WIS.—One course; 22,000 players annually; fee, 10 cents per game. Annual maintenance, \$5,000.

RICHMOND, IND.—One course.

ROBINSON, ILL.—One course.

ROCHESTER, N. Y. (Department of Parks).—Two courses, 18-hole and 9-hole; 12,000 players monthly; fees, \$3 per year to residents, \$5 per year to non-residents. Caddies brought; professional instructor. Acreage, 18-hole course, 250; 9-hole course, 150. Annual maintenance, \$12,000.

ROCKFORD, ILL.—Two courses, 18-hole and 9-hole; no fees; lockers, \$3.50 annually. Acreage, 90 and 57. Annual maintenance, \$8,600.

SACRAMENTO, CALIF. (Park and Recreation Department).—One course, 9-hole, one under construction; crowded; no fees. Club house, lockers \$5 per year. Caddies brought; professional instructor. Municipal Golf Club, \$1 per year. Acreage, 50. Annual maintenance, \$4,000.

St. JOSEPH, Mo.—One course; no charge.

St. LOUIS, Mo. (Division of Parks and Recreation).—Two courses, one 9-hole and one 18-hole; 10,399 permits in 1922; no fees. Municipal Golf Club; club building; lockers, \$3.50 upper, \$5 lower; dressing-room, \$20 annually. Caddies provided or brought. Annual maintenance, \$13,125.

St. PAUL, MINN. (Playground Department).—One course, 18-hole; 42,000 players annually; fee, 20 cents per round. Club and club house; lockers, showers, etc.; \$7.50 per season for lockers; 10 cents charged for use of shower and towel. Caddies brought; professional instructor. Acreage, 100. Annual maintenance, \$3,000.

SALT LAKE CITY, UTAH (Department of Parks and Public Property).—One course, 9-hole; average attendance, 700 weekly; fees, 35 cents for 18 holes. Club house. Caddies; instructor. Acreage, 52½. Maintenance, 1922, \$23,243.51.

SAN ANTONIO, TEX.—One course; no charge. Annual maintenance, \$7,800.

SAN DIEGO, CALIF. (Park Commissioners).—One course, 18-hole; 28,970 players, 1922; fees, 50 cents per day, \$2 per month, \$12 per year. Municipal Golf Club. No club house. Caddies provided or brought; professional instructor. Acreage, 175. Annual maintenance, \$5,800.

SAN FRANCISCO, CALIF. (Park Department).—One course, 18-hole; players, 125 week days, 500-600 Saturdays, 700-900 Sundays; fees, 50 cents per day, \$1 per month. Caddies; instructor. Acreage, 100. Annual maintenance, \$15,000.

SEATTLE, WASH. (Park Department).—Two courses, 18-hole and 9-hole; 104,561 players annually; fees, \$10 for annual ticket, \$6 for locker, 40 cents per 18 holes. Club and club house, showers, lockers, dining-room, etc. Caddies; professional instructor. Acreage, 150. Maintenance, 1922, \$14,447.81.

SHARON, PA.—One course.

SIDNEY, OHIO.—One course.

SIoux FALLS, S. DAK.—Two courses; 15,700 players; fee, 10 cents per game. Annual maintenance, \$1,000.

SOUTH BEND, IND.—One course; 25,172 players; fee, 15 cents per game. Annual maintenance, \$4,500.

SPOKANE, WASH. (Board of Park Commissioners).—One course, 9-hole, now being enlarged to 18-hole; 32,399 players, 1922; 135 season tickets sold. Season ticket, \$20, round tickets, 25 cents. Club house, lockers, \$5 and \$3. Caddies provided or brought; instructor. Acreage, 200. Annual maintenance, \$7,228.52.

SPRINGFIELD, ILL.—Two courses; no charge. Annual maintenance, \$19,000.

SPRINGFIELD, MASS.—Committee at work on project; may be ready 1924.

SPRINGFIELD, OHIO.—One course.

STAMFORD, CONN.—One course.

STOCKTON, CALIF.—One course.

SYRACUSE, N. Y. (Park Department).—One course, 9-hole; fees, 25 cents per day, \$3 per season. Club house being erected. Caddies. Acreage, 30. Annual maintenance, \$378.

TOLEDO, OHIO.—Three courses; 111,000 players annually; free through 1923; beginning 1924, 25 cents a game for 18 holes. Annual maintenance, \$16,000.

WALLA WALLA, WASH.—One course.

WASHINGTON, D. C. (War Department).—Four courses, 9-holes each; 198,402 players in 1923; fees, 15 cents for 9 holes on week-days, 25 cents for 18 holes week-days, 25 cents for 9 holes Saturdays, Sundays; \$20 for season ticket, includes locker, unlimited play week-days and one round of 9 holes Sundays, holidays; \$2 for monthly ticket of 10 coupons, including locker for month and privilege to play 10 rounds of 18 holes during week-days, or 9-hole game per coupon on Saturdays, Sundays or holidays. Two field houses; no clubs. Caddies; professional instructors. Acreage, 300. Courses managed by concessionaires.

WILMINGTON, DEL.—One course; 19,000 players annually; fee, 50 cents per game. Annual maintenance, \$6,500.

WINNETKA, ILL.—One course.

WORCESTER, MASS. (Parks and Recreation Commission).—One course, 9-hole; 1,100 players annually; fees, \$7 annually, daily \$1, locker charge, \$3 per season. Caddies; professional instructor. Club and club house. Acreage, 70. Annual maintenance, \$5,000.

EDITORIAL NOTE.—The following publications will prove of value to those who are interested in the subject of municipal golf:

Municipal Golf.—By A. C. Comey, 4 pages in the October, 1920, issue of *Landscape Architecture*, Brookline, Mass.

Articles on the construction and maintenance of municipal golf courses.—In the February, April and May, 1921, issues of *The Playground*, 315 Fourth Avenue, New York, N. Y.

Municipal Golf.—14 pages. Apply to Will O. Doolittle, Secretary, American Institute of Park Executives, Minot, N. Dak.

Bulletin of the Green Section of the U. S. Golf Association.—Issue of February 23, 1923, devoted to public golf. Apply to the Association, Washington, D. C.

Municipal Golf Links.—In the National Municipal Review, January, 1923. Apply to the National Municipal League, 261 Broadway, New York, N. Y.

Let's Work for More Public Golf Courses.—By Theodore Wirth, President of the American Institute of Park Executives. 8 pages in the March-April, 1924, issue of *Parks and Recreation*. Apply to Will O. Doolittle, Secretary, American Institute of Park Executives, Minot, N. Dak.

Mayors As Prospective City Managers

IN many a city or town throughout the United States there is a mayor who has served his community for two or more successive terms. Such a man, if his re-election has been due to his ability, integrity and personal popularity, rather than to machine politics, may have just the qualifications and practical experience which would make for a high degree of success in municipal administration elsewhere. The possibility of inducing some of these present and former mayors to enter the city manager profession, instead of retiring to private life in their home towns, is deserving of much more consideration than it has heretofore had.

Of interest in this connection is an editorial in the *Times-Dispatch* of Richmond, Va., commenting on the result of the recent mayoralty election in that city. Under the heading "Another City's Chance," this suggestion is made:

"When George Ainslie retires from the office of Mayor, which he has filled with conspicuous ability for some twelve years, it is to be hoped he will find it convenient and profitable to remain in Richmond, so that his expert advice and opinion will be available for the use of the city. That is

the selfish side. From the unselfish view-point, what an opportunity lies before some other city!"

In a letter to the Editor of *THE AMERICAN CITY*, enclosing a copy of the *Times-Dispatch* editorial, W. T. Dabney, Business Manager of the Richmond Chamber of Commerce, writes:

"Briefly, the occasion for this editorial was the recent defeat of the Mayor of the city of Richmond, who, under our form of government, is virtually City Manager; the difference being that the Mayor is elected for four years by popular vote, and selects four Directors to manage the business affairs of the city, who with the Mayor, constitute the Advisory Board. The Directors are confirmed by the Council, which is elected by the people.

"The Mayor was progressive, yet conservative; virtually rebuilt old Richmond and extensively improved undeveloped territory, at the same time living within the city's revenue and strengthening its credit. Richmond owns and operates its water, gas and electric plant, the latter for municipal purposes only. Hence, municipal experience and executive ability are especially necessary for successful management on the part of the Mayor."

It is probable that fifty or more new city managers will be appointed in the United States during the next twelve months. How many former mayors will be in the list?

Testimonial Dinner to John M. Diven

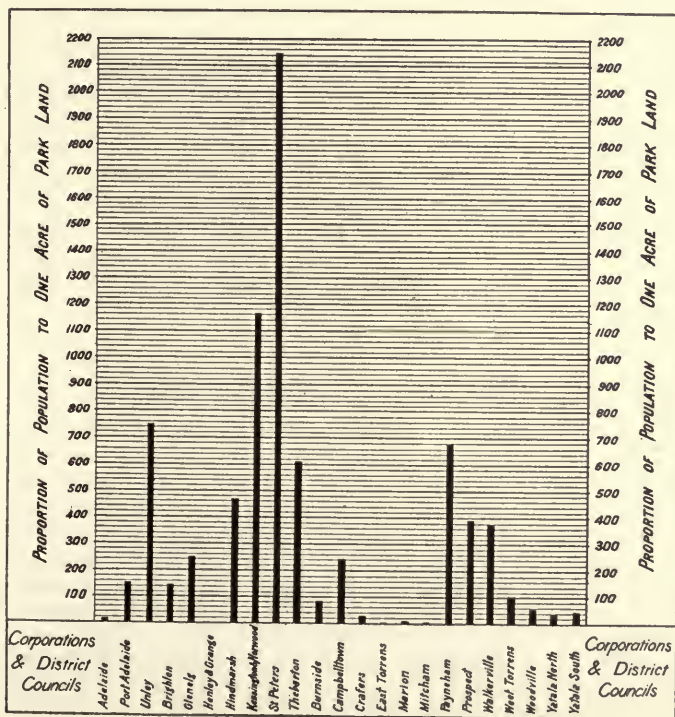
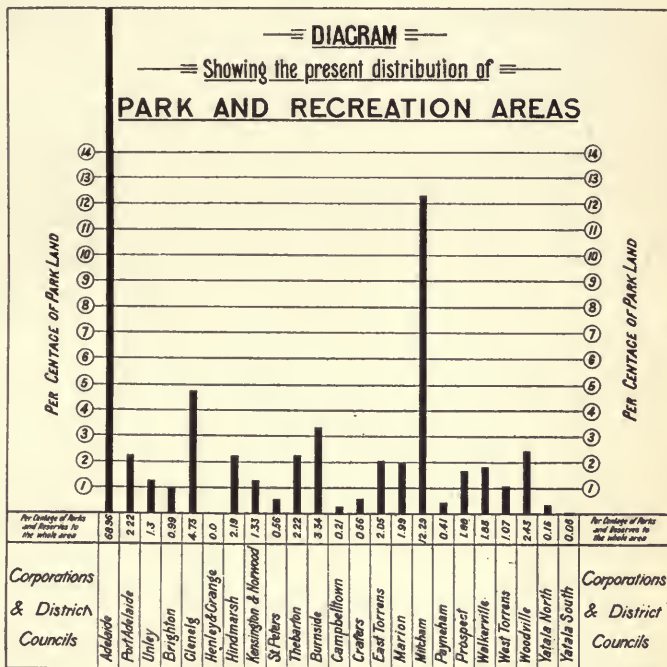
AT the convention of the American Works Association held at the Hotel Astor, New York City, May 19-23, a testimonial dinner was tendered to John M. Diven, who for forty years has been active in the American Water Works Association. He joined the Association 40 years ago, was President in 1892, Secretary and Treasurer from 1902 to 1912, Secretary and Editor to 1916,

and Secretary to February 1, 1924, when he retired and was unanimously elected by the Executive Committee to the honorary position he now holds as Secretary Emeritus. To show the high regard in which he is held by members of the Association, a substantial purse was presented to Mr. Diven, who has now returned to Troy, N. Y., as Superintendent of Water-Works, his former position.

Parks and Regional Planning in South Australia

Paragraphs from the Recently Published Report of W. Scott Griffiths, Government Town Planner, Adelaide

IN planning for the prospective growth of population in the metropolitan area, it is not only necessary to plan a proper connecting road system, but also to make ample provision for the safeguarding of the public health through the acquisition of sufficient park area conveniently located for the people. Authorities who have devoted their lives to studying the effect of city life upon humanity, declare that the physical condition of city dwellers is rapidly declining in comparison with that of those who live in the country. Everyone realizes that city life is more intense and nerve-straining than out-of-door country life. City life saps the energy of men and makes them less efficient. The remedy for this lies

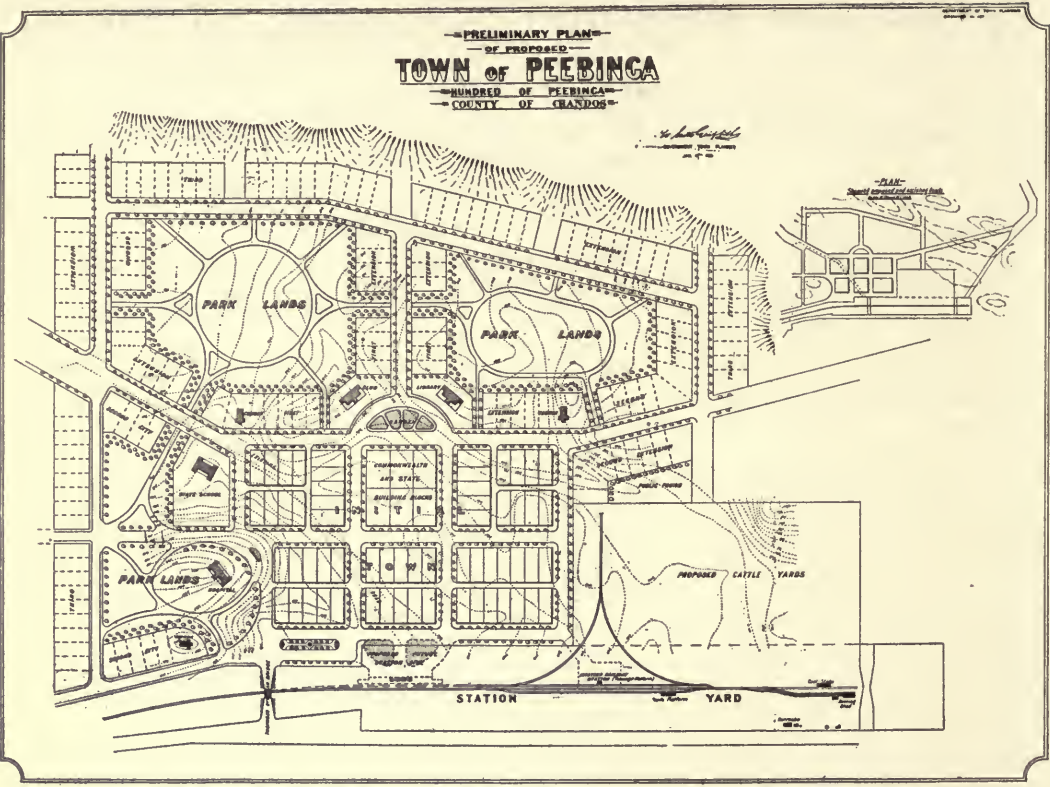


in providing increased means of open air recreation.

We boast of the area provided by the magnificent belt of park lands surrounding the city of Adelaide which no other modern city possesses, but at the same time we are neglecting our duty in respect to the outlying suburbs. By all means let us preserve the park belt, but do not starve the suburbs.

My investigation of the park distribution throughout the metropolitan area discloses conditions which should be remedied by the acquisition of more area, and this should be attended to at once, while the land is comparatively cheap; in a few years the values will so increase as to make the purchase almost prohibitive.

I am fully convinced the various local governing authorities are unaware of their position



in regard to open space, and trust the following tabulated statement and graphs will result in the same attention and action given as when I disclosed similar conditions in metropolitan Sydney. Many thousands of pounds were invested in the purchase of lands in various directions, but much expense would have been avoided had earlier attention been given.

A proper city plan is the foundation for all social and commercial advance. For people to remain healthy and happy, they must have proper houses in which to live. Adequate street facilities affect the housing prob-

lem, as people must have cheaper transit and be able to go quickly and easily to and from their homes and places of business.

The three vital problems to deal with are congestion, traffic, and public health. I have endeavored to show the position in respect to present and prospective growth of population, and the urgent need for guidance in the future distribution to avoid overcrowding in districts. The park distribution to-day is inadequate, and should be given attention immediately, otherwise, owing to rapid increased values, the result will become disastrous later.

Commercial Engineering and County Development

DR. GLEN LEVIN SWIGGETT, Chairman of the Committee on Commercial Engineering, believes that the county is the proper unit for a study which will have for its object the scientific location of industry and the reduction of the present economic margin between producers' and consumers' goods. To quote a recent statement from him:

"We have already arrived in the United States at a stage where economic community guidance is imperative in view of world-trade competition. Many communities to-day are supporting indus-

tries that are by their location a liability to the community and a greater one to the nation. Counsel and guidance of commercially trained engineers in every county will aid these counties to solve their problems relating to unwise employment and care of labor, seasonal and rotary; wrong standards of living, therefore, uneconomic; improper transportation outlets; standards and kinds of production; marketing opportunities; available credits; and, above all, to solve problems relating to housing and health, to the proper balance between the individual's duties to society and his own economic rights."

Some Problems of County Government Accounting

By Arthur J. Peel

Consulting Accountant

THERE are three obstacles which every professional accountant is likely to meet when he is called upon to prepare and install a modern system of bookkeeping for the county: (1) politics; (2) the human element; and (3) his own preconceived ideas as to what is necessary.

The Obstacle of Politics

It is unfortunate that too frequently a sincere move towards better accounting in county offices is blocked by politics. This is too well known to necessitate elaboration. Nevertheless, when the accountant, or the awakened county finance officers, can submit to the ruling body overwhelming evidence as to the value of a modern accounting system, the day is won. But there is an opposition which is based on sound theory and is so reasonable that we cannot afford to disregard it. Said a county commissioner in one of the Southern States, "Show me how we can get proper records which reflect actual operating costs classified by function, departments, and object, without the necessity of setting up an expensive accounting organization, or employing a \$5,000 expert accountant, and I'll back any plan that will give it to us. We are in a financial mess all the time, but have neither the trained man, or men, to handle a modern system, nor the money to employ additional clerical help of high grade."

Now here is an honest-to-goodness objection, and it makes good political talk. Nevertheless it is founded on a fallacy—and perhaps the professional accountant is partly respon-

sible! Scientific accounting is not necessarily complicated, neither is it necessarily expensive. There is a certain type of accountant who feels that he is not upholding the dignity of the profession if he admits that accounting—that is, good accounting—may be perfectly

simple, and within the field of the average clerical man after he has had the proper instructions. The all-important thing is the application of right principles. Now principles are not usually complicated; it is in their application that we run the danger of piling up detail and expense. If the professional accountant tackles the job as if he were preparing a cost system for a big factory, his reputation will be somewhat damaged so far as government accounting is involved.

The Human Element in County Official and Accountant

In the human element we have a real and serious difficulty—

and here we are treading on delicate ground. If the reader is a county official, then he, above all others, knows his own type. From personal knowledge the writer can testify to the splendid, unselfish character of many county officials, both men and women. We know of men and women who could be getting considerably more from the commercial and business world than they are drawing from the county, as treasurers, clerks of the court, registrars, auditors, and so forth. And, of course, the reverse is true in some cases. But speaking generally and with particular reference to the rural counties, is it not a fact that county treasurers and auditors, while they

Note by the Author

This article discusses some of the problems which face county government executives and professional accountants who may be called in to advise and recommend on the matter of better accounting methods. The roots of some time-honored policies and practices are deep-seated, and are not to be removed by superficial condemnation. The experienced county officer resents—and often with cause—the patronizing attitude of the professional accountant who thinks he knows exactly what should be done and is impatient with all methods which he considers ancient and effete. On the other hand, the county officer should be willing to adopt an attitude of "higher criticism" towards the prevailing system, and strip it of its venerable and traditional veneer, which is often the only thing that keeps it among the "things as they are." This desirable development will come when county officials lose their fear of modern accounting methods and practices; and they will lose their fear only when professional accountants make accounting systems simple.

may be splendid farmers, merchants, teachers, or private citizens, are often poor accountants? The auditor—if the county has advanced so far as to have an auditor—is not usually chosen because of any special ability with accounts and figures. The sheriff, who in hundreds of counties is the real collector of taxes and accountant also, may be an admirable policeman, but a most indifferent bookkeeper. And yet these are often the types of men for whom the professional accountant has to devise a modern accounting system.

This is one side of the picture. Let us hear what the county man has to say. A New York firm of accountants was called in to make a complete audit of the books of a county on the Atlantic seaboard. Three men were sent down and worked several weeks on the job. They prepared an elaborate balance sheet which was in accordance with all the rules of the profession. Their report was full of technical terms and complex comparisons. Not a solitary county official really understood the balance sheet, and only two or three professed to understand the report! The local press interpreted the report in their own way, and finally a local public accountant who had never had the benefit of New York experience and complicated finance, was called in to "interpret" the report. The way he "interpreted" it was to go through the books and prepare his own statement independent of the original. This case has been repeated in many places.

The county official argues along this line: "If from the simple accounts which we have you cannot prepare a simple statement which we can understand, what would you do with a complicated set of accounts such as you say we ought to have to meet the requirements of modern county government!" Of course, the answer to this is that in many cases the accounting records of the county are anything but simple, even in their antiquated form. To the writer this is one of the most helpful and encouraging features, for he has seen county finance officers extract from a perfect jungle of records, often unrelated to each other or to any controlling record, information which has been almost perfect in accuracy. If by sheer doggedness and close application a man can get something out of unscientific and clumsy records, what could he not do if he had modern accounts with all their safeguards, such as are provided by control accounts and sub-controlling operating records?

The third obstacle which was mentioned is the preconceived ideas of the accountant as to

what is necessary. You will notice we do not say "required." The requirements of a county are often a joke. In North Carolina, for example, it is required that a list of all payments and all receipts be posted at the court house door on the first Monday of every month, and as far as one can ascertain from the consolidated statutes, this is about all the accounting that the *law* requires! And in some counties in the state it is just about all they have!

Importance of Recognizing Incurred Liabilities

With the growth and development of modern county government, the requirements in county records have naturally increased. We find that almost every county has outgrown the "cash-book" system of accounting, which takes cognizance only of cash receipts and disbursements, and yet it is the "cash-book" system of accounting which prevails in most counties, and, in fact, in nearly all government offices. One of the first points raised when the reorganization of accounting methods is talked, is the necessity of placing the accounts of the county on a revenue and expenditure basis, instead of on a receipts and disbursement basis.

While counties have to recognize accrued revenue in some degree, the majority of them do not recognize accrued liability, or incurred liability. Not until the money is disbursed are expenditures recognized by the average county commissioner. The writer has audited county books which showed a surplus of several thousand dollars which had been used as a basis for tax requirements for the ensuing year, regardless of the fact that accrued liabilities existed at the time amounting to considerably more than the surplus. The argument for establishing accounts on an accrual basis is unanswerable, and naturally the professional accountant is likely to show impatience if the county people are not immediately convinced that this is so. This leads on to another question, the question of placing the accounts of the county on a double-entry system of accounting. Now to county officers who are not trained accountants, the word "double-entry" is fraught with all kinds of hidden complexities. There is only one way to destroy this false idea: it is for the professional accountant to explain very carefully and simply what double-entry means and the results obtainable. Some don't do this, however; they give the impression that they do not think anybody but a properly trained accountant can run accounts on a double-entry system.

Another obstacle which the accountant has to meet is to get county officials (and even Federal Government officials) to recognize such things as capital assets. Over and over again are to be found in county operating statements capital values and operating expense interwoven. Such items as "supplies and equipment" are as common as fines in a sheriff's book. The writer has very rarely seen the capital assets of a county set up on the books. All through government accounting right up to Federal departments, it does not seem to be considered necessary to take cognizance of capital values as being distinct from operating expense.

Mistakes Often Made by Public Accountants

The foregoing are some of the principles which are contended for by public accountants, and rightly so. But some go much further; not only do they contend for a recognition of revenue and expenditure on an accrual basis, double entry bookkeeping, and the separation of capital expenditures from operating expense, but they attempt to place the county on a profit-and-loss basis. The reasons why this cannot be done are probably quite clear to most readers. They may be summed up by pointing out that county government is not run for profit, and the nearest approach to such an objective is the pay-as-you-go policy. But because the county is not in "business" in the strict sense of the word, is no reason why a real attempt should not be made to develop, from scientific records, information which will furnish departmental and other costs.

Another common mistake often made by professional accountants who are unfamiliar

with the peculiarities of government accounting, is to attempt to incorporate in the general ledger accounts, the appropriation accounts when they do not synchronize with the logical divisions and functions of county government. Both county and state accounting systems have sometimes been wrecked by unwise attempts to tie up appropriations with operating accounts. We have to admit that some very ingenious attempts have been made along this line, but those responsible for them have lost sight entirely of the human element which has been discussed farther back.

The whole subject of appropriations will continue to raise a very big problem until legislators and political students recognize that there is only one logical and scientific position to take regarding the matter. Public moneys should be voted and appropriated in accordance with government *functions*, then by *departmental character*, and then by *object* (if necessary). It is common practice for Federal, state, and county governments to appropriate funds for personal service, for example, without specifying functional or departmental limitations.¹ Supplies are treated in the same manner. This system is antiquated, clumsy and confusing. Appropriations and budgets should be by function, department, service, and object, and should be made in this order. In county government we have such functions as Legislation, Administration, Law Enforcement, Judiciary, Health, Public Welfare, Correction and Charities, Public Education, and so forth. These are vital functions of county government, and appropriations should cover each of these distinctively and separately. Afterwards the appropriations may be further broken up and classified into budget items.

Athletic Field Unites Twenty-Two Organizations

IN Gloversville, N. Y., twenty-two organizations representing various faiths and interests are pulling together in a way other cities could follow to advantage. It started with their common interest in better public recreation.

A tract called Darling Field had been given to the city on the condition that it be improved for use as an athletic field within ten years; otherwise it would revert to the donor. The Federation of Eagles invited the various organizations of Gloversville to meet and discuss plans for equipping the field. Nineteen organizations responded to the first call, and a general committee was formed to arrange for a field day.

The field day was a financial success, but its financial success was nothing in comparison with its fraternal success. Catholic, Jew and Protestant worked side by side. Fraternal and social organizations, for the purpose of this project, merged

their small interests into one large interest. They voted to keep their general committee and to form a united organization, whose first community project should be to completely equip Darling Field.

Twenty-two fraternal, religious, social, military and labor organizations are now joined in the United Organizations of Gloversville. The Kiwanis Club has been the most recent to join. The Elks affiliated after the field day, turning over funds they had raised for the same purpose. About \$3,000 is now in the treasury, and whatever is needed further will be raised through high-grade concerts and other attractions. A cordial invitation to join at any time is extended to all clubs or societies of the city not already affiliated with the United Organizations.

—PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA.

The New Water System of Marshfield, Wisconsin

By F. E. Whittemore
Water and Light Department

MARSHFIELD, WIS., handicapped for the past twenty-five years by a water shortage that had become very serious, has recently completed a well-water system that seems to be a final solution of the problem. On account of the inadequate water-supply, industrial plants desirous of locating in Marshfield were forced to seek other sites; railroad shops and watering stations were built at towns not as convenient but having better water facilities; new residents, and even tourists, did not come to Marshfield, for one main reason—lack of water. There is no doubt that if the water system had been satisfactory, Marshfield would far exceed its present population of 8,000.

Early Water-Supplies

The first water and light project of Marshfield dates back to 1898, when a bond issue of \$125,000 was floated to furnish funds for the new plant. Just previous to this time, the town had been destroyed by fire, and no doubt the disastrous conflagration prompted the action. In 1901, when the plant came under municipal ownership, the six blocks of mains and the few small wells were unable to supply the needs of the people. Consequently, a consulting engineer was employed to assist in solving our problem, and as a result of his recommendations 21 wells were drilled to discharge into a common header 17 feet below the surface, which terminated in a concrete reservoir. Because of the proximity of the wells and the concentrated drawing of the water from one section, the water-level lowered to such a depth that the centrifugal pumps were unable to function. In order to use the same wells, a series of jack pumps with a plunger in each well was constructed, similar to those

used in the oil fields. By means of a toggle mechanism, the plungers were fastened to long rods, which in turn were fastened to an eccentric wheel driven by an electric motor. This mechanism was very clumsy and inefficient, but temporarily served its purpose.

The next solution offered was from a St. Paul engineering concern, which thought it possible to obtain the water in sufficient quantities by sinking a 30-foot concrete well, 70

feet deep. A series of screened openings opposite the sand formation allowed a small amount of water to enter, but the supply was not lasting. Later, several perforated iron pipes were driven radially from the pit into the sand formation, in hope that the water would enter the pipes and flow to the well, but the labor, time and expense were in vain.

In further efforts to improve conditions, the Council called upon the state engineers and

Do You Send Your Water-Works Officials to Conventions?

This article describing the solution of Marshfield's water problem, presented in an interesting manner by Mr. Whittemore, should be an example to other cities of the value and inspiration of water-works conventions to city officials. The meeting of the American Water Works Association last month was an inspiration to hundreds of water-works men, not only through the valuable technical papers presented and the discussions resulting therefrom, but the contacts and informal discussions, as well as the studies which those who attended were able to make of the latest appliances and methods adapted to water-works practice.

geologists, who reported that a large well-water supply at Marshfield was impossible. Thousands of dollars were spent on engineers' fees, improvised schemes and new equipment, and yet Marshfield was without water. In the early part of 1923, the situation became so serious that a 12-mile pipe line to the river was considered.

A few members of the Water and Light Department attended the Wisconsin Water Works Convention at Stevens Point and became interested in an exhibit displayed by a deep-well pump exhibit. The water problem of Marshfield was briefly explained to the president of the company, and his suggestion was that the Council allow him to make a personal investigation of the present water system and the possibilities of an increased supply. The many failures and difficulties which others had



METHOD OF CONSTRUCTING NEW WELLS

Test drilling is followed by inserting a 32-inch casing into which the pumps are lowered, as shown in the illustration

encountered in attempting a water-supply did not appear encouraging, but after a thorough study of conditions, a proposition was presented to furnish Marshfield with 2,000,000 gallons of pure well water on a guaranteed basis. This proposal appealed strongly to the Council, as a quarter of a million dollars had already been spent with practically no results, and to have a firm actually agree to put up a surety bond to produce a pure well water supply of 2,000,000 gallons a day, showed us that this company must know their business. At any rate, we had nothing to lose and everything to gain, for if the water could be secured we wanted it at any price, but if not available, the tests and trials would cost us nothing.

On July 25, an eventful day in the history of Marshfield, the Council contracted with the Layne-Bowler Chicago Company for a 2,000,000-gallon supply every 24 hours. The existing supply was about 300,000 gallons. As the city would not allow the contractors to drill the new wells within a mile of the old ones, it was necessary to make extensive geological investigation of new sections. The most probable supply appeared in the Eau Plaine basin, north of town, but when a test was made nothing but clay was found. Forty-seven test holes were then drilled in other parts of the surrounding country, and about a mile and a

half from the old wells an excellent water-bearing formation was discovered. After determining the direction and velocity of the underground water, three well sites were selected a quarter of a mile apart, so that the wells would have little effect on each other when operating. By this method, the water would not be drained from one area and ruin the supply, as had formerly occurred. The construction of the new 30-inch wells was decidedly different from the old 6-inch wells. Instead of equipping the wells with a fine-mesh gauze screen, which tends to impede the flow of water, a cylindrical shutter screen with large openings was set at the bottom of the well opposite the water-bearing formation. The well was then pumped beyond its normal capacity in order to work out the loose sand; at the same time, tons of gravel were fed in from the top and replaced the sand, so that a large gravel-wall well several feet in diameter was constructed in the sand formation.

Upon completion of the wells, vertical centrifugal pumps were set, with the pump bowls approximately 50 feet below the concrete foundations, and the motor and thrust bearing on the surface. A small brick pump-house with concrete floor, windows, roof and derrick completes the individual pumping unit. The three vertical pumps, each of 550 gallons



TEST WEIR OF WELL NO. 1 AT MARSHFIELD, WHICH WAS OPERATED FOR ONE WEEK



A VIEW OF THE OLD SYSTEM OF 19 JACK-PUMPS WHICH WERE OPERATED FROM THE STATION IN THE LEFT BACKGROUND

per minute capacity, discharge into a centrally located concrete reservoir. A brick building constructed above the reservoir serves as a pumping-station for the two booster pumps and the automatic control apparatus. The two booster pumps, of 500 and 900 gallons per minute, pump the water from the reservoir into the mains at 85 pounds pressure, which results in a 55-pound pressure in the city. The entire pumping system is governed by a float switch in the stand-pipe. When the float reaches a certain level, the small booster pump is started automatically. When the water-level in the reservoir is lowered one foot, an automatic mechanism starts the pump in well No. 1. If well No. 1 cannot supply the demand, the water-level in the reservoir continues to lower and well No. 2 is started. If the water-level still decreases, well No. 3 functions, and, in addition, the large booster pump is brought into service. The order of operation is changed each day, so that the duty of the individual wells and pumps is the same over a given period of time. This means that at all times a constant pressure is maintained on the system, and when the supply is not needed the pumps are cut off and a large saving of power results.

The official acceptance test started at 2 P. M., February 11, and was completed at 2 P. M., February 12; 2,000,000 gallons of pure well water poured over the weir during that time. This was the combined production of the three wells.

The total power used on the three pumps to produce approximately 2,000,000 gallons per day is between 25 and 30 horse-power. This presents a very striking comparison with the

former system, which produced 300,000 gallons per day with 50 horse-power. Assuming a total of 30 horse-power, or 22.4 kilowatts in 24 hours, 537 kilowatt-hours would be consumed and 2,000,000 gallons of water pumped, so that 0.27 kilowatt-hour is used per 1,000 gallons, at a cost of 3 cents per kilowatt-hour. Eight-tenths cent of the cost per one thou-



DEEP-WELL PUMP IN PLACE WITH HOUSE BEING BUILT AROUND IT

The houses are built in such manner that if it is necessary to remove the pump the back can be easily dismantled without damaging the pump-house

sand gallons for pumping the water from the wells to the reservoir.

When it was shown that the three wells, drilled one mile and one-half from the powerhouse, produced the required amount, the contractor was granted permission to install two additional wells within the mile limit. The contractor was not required to install the fifth well, but did so as an added protection for the water-supply. Well No. 5, which was drilled only 20 feet from one of the old 6-inch wells, produced 300 gallons per minute, while the former well produced only 25 gallons per minute. Thus, out of the same sand stratum and all other conditions the same, a well of twelve times the capacity was constructed due solely to scientific application of engineering principles of well construction.

With the five wells, a supply of 3,000,000 gallons a day is readily obtainable, so that at present it is evident that Marshfield's water-supply is not lacking. It is impossible to estimate the value of our new system; already the

railroads are using water in large quantities, which will mean a large revenue for the water department; in fact, the engineers now run the engines to Marshfield whenever possible, on account of the excellent water. The citizens readily noticed the increased pressure and improved quality. There is no water purer than well water which has trickled through miles of sand and gravel at an exceedingly slow velocity.

Two fires have occurred since the new water system has been in effect and, with the steady pressure, the fire department had no trouble in keeping the blaze under control. The pumps were unnecessary, as with all the streams playing on the fire the pressure remained practically constant at 55 pounds.

Without a doubt, the new water system is the greatest thing that has happened in Marshfield in many years. The stand-pipe is always full and at the time of the test it overflowed for the first time in twenty-five years.

Five Types and Sizes Now Constitute the Recognized Standard of Paving Brick

WHEN the first step toward simplification of paving brick varieties and standards was taken in November, 1921, paving brick manufacturers throughout the country had been making 66 different types and sizes of vitrified brick for the paving of city streets and country highways. Specials of a dozen different kinds were included in this list. The gratifying progress that has been made in simplification in the short period of three years is the result of cooperative action on the part of the representative engineering organizations of the country and the paving brick manufacturers, under the guidance and leadership of Herbert Hoover, Secretary of Commerce, and his Division of Simplified Practice, headed by William A. Durgin.

Following is the list of officially recognized types and sizes of paving brick as adopted by the Perma-

ment Committee on Simplification and Varieties and Standards of Vitrified Paving Brick of the United States Department of Commerce at its meeting held on March 28, 1924. The table also gives the respective percentage of total shipments represented by each type and size:

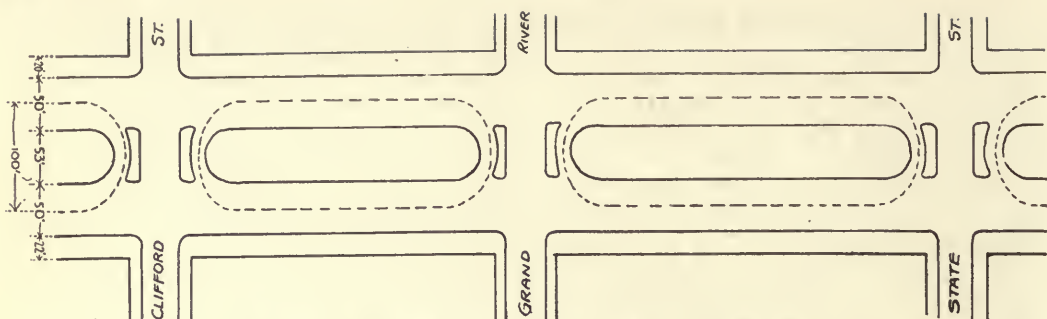
	VARIETIES (Sizes in Inches)			Per Cent of Total Shipments in 1923
	Width	Depth	Length	
	(As Usually Laid)			
Plain wire-cut brick (vertical fiber lug- less).....	4 "	x 3 "	x 8½"	38.8%
	4 "	x 3½"	x 8½"	13.7%
Wire-cut lug brick (Dunn)	3½"	x 3 "	x 8½"	2.3%
	3½"	x 4 "	x 8½"	6.4%
Repressed lug brick	3½"	x 4 "	x 8½"	18.2%

Small Towns and Villages Do Extensive Paving

EXTENSIVE paved street systems a few years ago were held to be things which only the city could have, and if a town or village adopted a paving program, it very likely called for nothing more than the paving of three or four of the principal blocks on "Main Street." In recent years, however, street paving has been widely extended in the smaller towns and villages at the same time that it has been extended in the larger cities. Towns of a thousand or so now point proudly to a pavement all the way along the business section and also side streets.

This paving program has included asphalt pave-

ments, brick pavements and concrete. The following statistics relate only to concrete pavements: In Sherwood, Wis., population 2,650, concrete pavements totaling 261,483 square yards were laid prior to January 1, 1924, making approximately 26 miles of 18-foot pavement; Glen Ellyn, Ill., population 2,851, has 251,939 square yards of concrete paving, equal to about 25 miles of 18-foot pavement; Mifflinburg, Pa., population 1,744, has 36,800 square yards of concrete pavement today; while Whittier, Calif., population 7,997, has 260,117 square yards of concrete pavement, equal to about 25 miles of 18-foot pavement.



WIDENING OF WASHINGTON BOULEVARD, DETROIT

The size of the center parkways, before the most recent widening, is shown by the dotted lines

Detroit's Struggle with the Traffic Problem

By Charles Evan Fowler
Consulting Engineer

THE traffic conditions in Detroit are not vitally different from those in many other cities, but are more intensified, as might be expected in the home of the automobile where nearly every family owns some sort of gasoline vehicle. There are now about 250,000 machines in the city and suburbs, for a population of about one million; and if there is a continuance of the increase in the number of machines at the present rate of over 30 per cent per annum, it is evident that in another three years the traffic problem will have increased nearly a hundredfold.

The writer's data and personal investigations would place Los Angeles first for traffic congestion, with Detroit second, New York third, and Chicago fourth, although such cities as Pittsburgh and Boston present greater difficulties in reaching satisfactory solutions, on account of narrow and crooked streets.

Storage or Street Space for Automobiles

The immediate need of every city is for some arrangement which will make it possible to do away with the parking of cars in the congested districts. The plan has been proposed for New York, of garages under Central Park and Bryant Park for 30,000 and 4,000 autos respectively, and also for parking space in the basements of office buildings, stores, and hotels. This latter plan has been successfully tried in Los Angeles and Washington, D. C., to a limited extent. To provide more space for through traffic, Police Commissioner Enright of New York has proposed carving

out some wider streets and avenues, after the manner of Napoleon I and III in Paris. Elevated roadways have been suggested, and have proved successful in a limited way around the Grand Central Terminal.

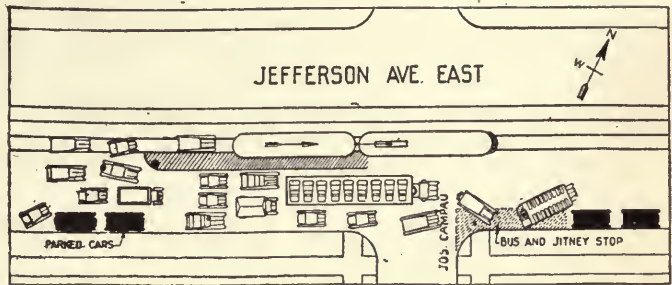
The same questions have been studied in Chicago, and one enthusiastic traffic student has proposed a huge three-level garage for 40,000 machines, probably in Lake Park, which he estimates could be emptied in 40 minutes! Large skyscraper garages have also been proposed for Chicago, with fast elevators.

Detroit has not as yet reached this stage, as there are many down-town vacant lots, many garages, and a reasonable amount of parking space along the curbs of the very wide streets and boulevards. To provide such space, the curbs have been moved back on 32 miles of streets, the widening of 25 miles of which was done in 1923. For example, Washington Boulevard, down-town, is 200 feet wide and four blocks long. Some years ago the two 25-foot driveways were widened to 33 feet, but on account of traffic growth they were again widened last year to 50 feet each. Now autos are allowed to park end-on against the curb of the center parkway, but in not more than a couple of years hence this must be stopped. The improvement of this thoroughfare is shown on the map herewith, which shows also the island sidewalks, inside of which are drives for turning from one side to the other without disturbing cross-street traffic.

Michigan Avenue is 100 feet wide and is one of the great diagonal streets, with 17-

foot sidewalks. It is now arranged to set the curbs back 4 feet on each side, thus providing a 72-foot roadway.

The Detroit street-car system is owned by the city, and the management is constantly seeking means to facilitate the transport of the 80 per cent of the people who ride on the cars and busses, as against the 20 per cent who ride in autos but who nevertheless occupy more than 80 per cent of the streets. A sketch recently published shows the condition which exists where the "Fifth Avenue" busses, the jitneys, the parked cars, and the huge auto factory body trucks monopolize the streets and delay not only the street cars but the automobile traffic as well. The suggestion has recently been made that very soon it may prove necessary to prohibit all parking in a large area in the down-town section and on some of the principal outlying thoroughfares as well. When this has been done, it will force action on further down-town garages and parking spaces. The carving out of the proposed wider streets, shown on the accompanying map, has not as yet been undertaken, but it will come and should be done while property is still comparatively cheap.



SOME OF THE ELEMENTS OF STREET CONGESTION IN DETROIT

Traffic Regulation

The regulation of traffic on Woodward Avenue and adjacent streets is carried out in much the same way as on Fifth Avenue, New York. Four towers are in use, of the type illustrated. From these towers an orange light is shown before a change is to be made from the green "Go ahead" light to the red "Stop" light. The complicated traffic from the converging streets is governed in addition by signals from the tower man.

The following paragraphs from the 1923 Report of the Detroit Police Department describe other recent improvements in methods of traffic regulation:

"Some of our main arterial highways were designated as 'Stop Through Streets.' In comparison to the number of accidents on these through streets for the previous year, there has been a reduction of 5 per cent in accidents, and the establishment of the regulation on these streets has proved such a success that other streets are now being considered for this year.

"A new innovation on our main arterial highway was the elimination of the right- and left-hand turning of vehicles for a distance of ten blocks. This greatly expedited and facilitated the movement of pedestrian and vehicular traffic.

"There have been established five new-type post-and-chain safety zones, in addition to three raised platforms. This department is contemplating the erection of a large number of the post-and-chain safety zones. All of these zones are equipped with proper safety lights."

Detroit now has a force of 1,975 police, of whom only 138, or 7 per cent, are on traffic duty. New York City uses 1,800 out of 12,400 officers on traffic work, or 14.4 per cent; and the New York City Commissioner has asked that this traffic force be increased by 1,000 more men.

Main Traffic Arteries and Highway Widening

The recent regulation which requires all autos to come to a dead stop before entering main traffic arteries has prevented a large percentage of the accidents and wrecks. The most important regulation, however, was the establishing of a traffic loop surrounding the



ONE OF THE DETROIT TRAFFIC TOWERS

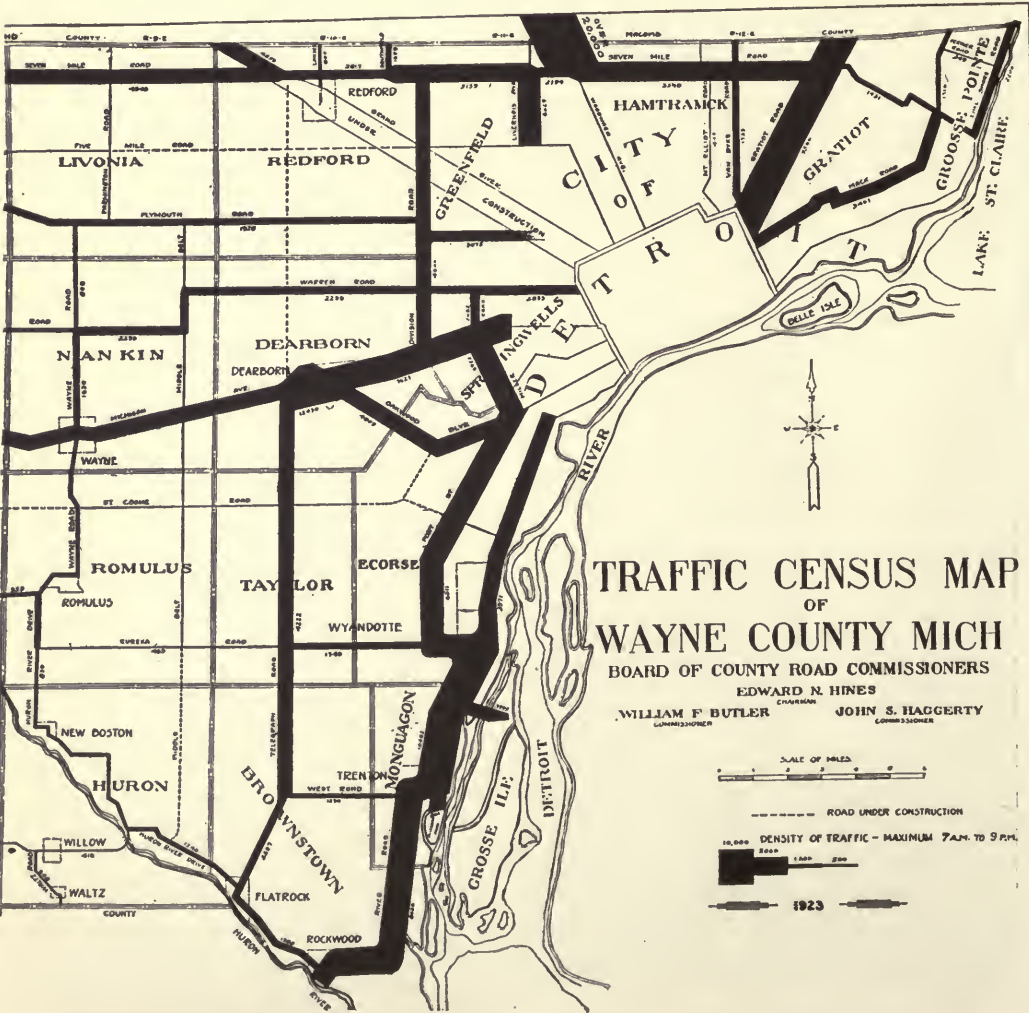
congested area, around which traffic is forced by one-way streets and "no right-hand" and "no left-hand turn" streets.

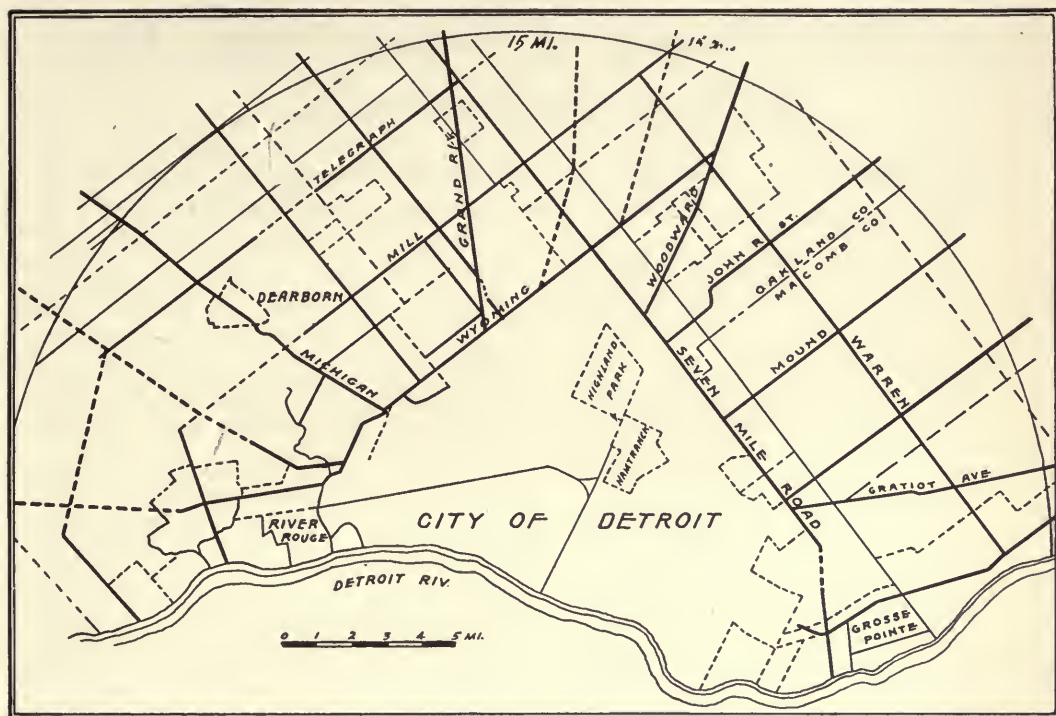
The accompanying traffic census map shows the traffic on the main highways entering the city. This traffic follows the law that is true for other places, of an increase from tourist traffic of about 100 per cent for the summer months over the rest of the year. To care for this traffic, the Wayne County Road Commission is constantly at work paving more of the existing highways and widening the paving on those already paved. Further substantial relief can come only with the opening of new streets outside the present city boundary.

The most notable widening outside of the down-town area is of Woodward Avenue to 200 feet in width from the outskirts of the city to Pontiac, a distance of over 10 miles! This almost unparalleled piece of road build-

ing is being done under Governor Grosbeck by state forces and is requiring very extensive condemnation. Another great piece of state work will be the paving of Grand River Avenue from Detroit to Lansing, a distance of 75 miles. The last 50 miles of this will be laid in its entirety this summer, by the use of convict labor, and in a large measure with war equipment which was purchased cheap from the Federal Government. Splendid results are being obtained in this way, and at a saving in cost estimated at \$8,000 per mile, as compared to the lowest bids received.

The City Plan Commission, the Rapid Transit Commission and other officials in the Detroit Metropolitan Area have devised a network of "super-highways" for that part of Greater Detroit yet to be built up. On the map showing this proposed network, the heavy lines indicate streets that would be widened.





PROPOSED NETWORK OF "SUPER-HIGHWAYS" FOR GREATER DETROIT

The heavy dotted lines are routes that would be opened up new for super-highways. The super-highways generally are three miles apart. Each is to be 204 feet wide and to contain four car tracks, two for local traffic and two for rapid transit surface lines. Minor streets would pass under the rapid transit car lines at crossings.

American cities are coming to realize that

the opening or widening of streets must not be undertaken without careful study of the relation to other public works and utilities, such as water-supply, sewerage, electric light and power, gas supply, street railways, rapid transit, bus lines, port development, and, last but not least, parks, parkways, and boulevards. This coordination is being attempted in Detroit by the City Plan Commission.

Tampa Votes \$3,000,000 for Municipal Improvements

AFTER several years of concerted effort the Tampa Board of Trade has succeeded in getting under way the project of extending the present sea-wall from the city limits to a point about $2\frac{1}{2}$ miles distant, along Tampa Bay. Just as this great work is being accomplished, the citizens of Tampa have voted, on April 22, a \$3,000,000 issuance of bonds for municipal improvements.

The bond issue provides, among other things, for the extension of the present sea-wall and drive to the city limits, where it will meet the county sea-wall, construction of which will no doubt start immediately. It likewise provides for the extension of said sea-wall and drive at the end nearer the business part of the city, to be continued until it reaches the Lafayette Street bridge. When the city and county sea-wall projects are completed, Tampa will have nearly 5 miles of sea-wall with double boulevard and parkway, along the edge of historic old Tampa Bay.

To amply care for the increasing demands for heavy traffic on the Bayshore, the sea-wall will

be constructed 132 feet from a newly created property line. The wall will follow the outline of the Bayshore. Immediately adjacent to the wall a 10-foot sidewalk will be constructed, next a 24-foot driveway, a 20-foot park space, 24 feet for the double street-car track, another 20-foot park space, a 24-foot driveway, and a 10-foot sidewalk. The cost for the county's part of the sea-wall will be around \$500,000.

NOTE.—The improvements provided for in the bond election include \$111,000 for the widening of Lafayette Street and construction of a viaduct over the Seaboard Air Line Railway tracks; \$215,000 for the erection of an addition to the city hospital, and \$35,000 for a hospital for the negro race; \$750,000 for extension of the sewerage system; \$100,000 for extension of city water-mains; \$900,000 for three new bridges over the Hillsborough River, two of which will be constructed in the main downtown section of the city, and the third in the Latin district; \$100,000 for improvement of the fire-alarm system and construction of new fire stations; \$40,000 for a new incinerator and the purchase of a site; \$125,000 for improvement of public parks and acquisition of additional park lands; \$75,000 for purchase of property for public wharves and sheds; \$250,000 for extension of the present sea-wall and parkway; \$250,000 for the erection of a public auditorium.

Control of Waste of Water from Fire Service Connections

Report of Committee on Private Fire Supplies from Public Mains, Adopted at the Annual Convention of the National Fire Protection Association, May, 1924

THE study and control of waste in all branches of industry is becoming increasingly important. The control of waste of water from fire service connections has a direct relation to the reduction of waste of property and of lives by fire, which is the purpose of the National Fire Protection Association. Water-works organizations are giving constant attention to this problem, and ingenious methods have been developed by engineers to stop the waste of water in public systems.

The general introduction of automatic sprinklers has stopped much of the tremendous waste of water which was formerly inevitable in extinguishing fires and has incidentally brought up new questions with reference to private fire service connections.

Safeguarding the public water system against waste of water through private fire connections is being accomplished in various ways, depending on local conditions. This waste may be placed under two headings:

- A. Waste occurring under normal conditions of no fire flow
- B. Waste occurring under occasional conditions of fire flow

Control of Waste Under Conditions of No Fire Flow

The ways in which unknown flow through a fire system may occur under normal conditions are so varied that a remedy which would be best for one case would not be best for all. The most common losses are:

- 1. *Ordinary slow leakage* through lead joints, continuous and sometimes considerable where the pressure is high or the systems old. This is present in some degree in all systems.
- 2. *Sudden leakage* by blowout of a joint or bursting of a pipe, usually quickly discovered and stopped unless the water escapes through a concealed channel.
- 3. *Wrongful use*, such as wetting of roofs or watering lawns from hydrants. This is, of course, improper without some understanding with the Water Department.
- 4. *Emergency use* through temporary connections from sprinkler drains or other pipes. This is capable of adjustment through cooperation of the user with the Water Department.
- 5. *Malicious theft*, which is negligible in a well-arranged plant.
- 6. Waste through *ignorance* or *carelessness*, more common than malicious theft, but controllable.

PRESENT METHODS OF CONTROL

Loss of water from these causes is now being well controlled by:

- (a) Separation of the pipes supplying water for industrial purposes from the fire service pipes

within the property

- (b) Sealing the outlets, such as hydrants and sprinkler drains

- (c) Using detectors or fire service meters on the fire service connections

Methods (a) and (b) have been longest in use and will doubtless take care of the large majority of plants having modern systems of automatic sprinklers.

Method (c), the use of a detector consisting of a weighted check valve with small by-pass meter, has been in use for several years in a few large cities with satisfactory results. Within the year further improvement of this detector has been made, and laboratory tests for determining the degree of accuracy to be expected from it indicate that up to 25 gallons per minute can be detected with the same accuracy as with an ordinary small-size meter.

For the comparatively few cases which cannot be covered by any of the above methods meters may be permitted, but these should be of the fire service type, which are specially designed to offer minimum obstruction to large flows.

SUGGESTED LOCAL REGULATIONS

Complete cooperation should be encouraged between the water department and the water user, by a carefully drawn set of rules and regulations, including, in addition to other necessary rules appropriate for the locality to which they apply, the following:

- 1. Private pipe systems from which water is used for fire service should usually be independent, within the property, of pipe systems used for domestic service. Exceptions to these general requirements may be permissible in special cases where water available from the manufacturing system is at such volume and pressure as would be a material aid in case of fire, and in such special cases the necessary points of contact between the two systems should be provided with suitable check-valves or sealed gate-valves, or both, for preventing waste of water through the domestic system.
- 2. Unmetered water should not be taken from any part of the fire system except in case of fire or test.
- 3. (*Optional.*) All sprinkler drains, hydrants and hose outlets on stand-pipes may be sealed by the Water Department at their discretion under the following conditions:
 - (a) Requiring a report from the user when the seal is broken
 - (b) Requiring a notice from the user before testing through hydrants or sprinkler drains
 - (c) Requiring a nominal charge for resealing

NOTE.—For a still further safeguard, indemnity to the Water Department may be secured by requiring the user to file a bond to be forfeited in the event of wilful or persistent violation of the rules or of abuse of the fire service furnished by the Water Department.

Inspection

The fire service connections to private properties should be inspected as systematically as the public hydrants which form a part of the general fire protection of the community. This inspection should be made independently or jointly with the owner's representative, as conditions may require.

As water-works engineering and fire-protection engineering are not exact sciences, care should be taken in framing specific rules to avoid such universal conclusions regarding the control of unknown flows as will discourage the study of local conditions which always have an important bearing on every problem. With these recommendations the average water-works manager may be relied on to use discretion in applying remedies for his specific problems in such a way as not to impose conditions which will discourage the use of the best fire protection.

Control Under Conditions of Fire Flow

In addition to the causes of loss of water under normal conditions is the possibility of waste of water through broken or inaccessible connections during the progress of a fire. In reports of water-works committees on this subject, there appears not to have been much progress made in fixing a standard practice. This is not surprising, as in most cases complicated engineering problems are involved. The fundamental point, or course, is to bring about the use of water in the way that will most surely extinguish the fire, prevent the destruction of property and the possible spread of the fire to conflagration proportions with great loss to the community.

Two methods of meeting this problem have been used over a long period of years, namely, by the restriction of pipe sizes, and by careful placing of the control gate-valves.

RESTRICTION OF PIPE SIZES

Some cities, appreciating the difficulty of obtaining control which would be absolutely certain under all conditions, seek to decrease the hazard of loss of this kind by limiting the size of the pipe connection in some cases to as small as 4-inch, and in this practice an old custom is being followed which was established many years ago before the science of fire protection with automatic sprinklers was well developed.

In order to obtain a general view of the present-day water-works practice, recent inquiries were made through a large number of water departments supplying water to sprinklered properties,

as to the size of the connections allowed, charges for fire service, use of meters, etc. A questionnaire sent to 259 cities and towns in 18 states is summarized as follows:

The question relating to size of connections was answered by 239, of which 181, or 76 per cent, were municipally owned, and 58, or 24 per cent, privately owned water-works.

Of the 239 who replied to these questions:

	Municipal	Private
9 made definite restrictions to 4 in. size..	6	3
99 allowed connections up to 6 in. size..	76	23
54 allowed connections up to 8 in. size..	39	15
10 allowed connections up to 10 in. size..	8	2
6 allowed connections up to 12 in. size..	4	2
34 made no restrictions		
13 allowed connections from 50 per cent to 100 per cent of the capacity of the main.		

The 14 not included in the classification above made definite replies indicating a general policy of treating each question as a special case.

This survey of general practice and the lack of unfavorable experiences in the use of the larger connections where properly controlled, indicate a very general recognition of the benefits derived from private protective systems and the need of giving them an adequate supply of water.

For best results, with adequate pipe sizes for the sprinkler connections, general reliance must apparently still be placed first on proper means of control of the connections, and second, a good system of handling such means of control in an emergency. Thus far it has been found extremely difficult, if not impossible, to find anything which will satisfactorily replace intelligent human control.

LOCATION OF GATES

The usual gridiron systems of distribution piping in cities are well adapted for control of waste if properly provided with gate-valves. Controlling valves are placed at street intersections and other strategic points so that in case a disaster makes the nearest gate inaccessible, it should always be, and usually is, possible to shut off the broken hydrant or a sprinkler connection, either by a gate further back or by successive gates at increasing distances. The danger of bleeding important trunk mains is lessened by the common practice of paralleling them with distributing mains, usually of smaller size, the flow in which is controlled by accessible valves.

A system of handling these control gates should be worked out to obtain the fullest cooperation between the fire department and the water department.

Newark Again Reduces Its Infant Mortality Rate

THE infant mortality rate in Newark in 1923 was 68.0, the lowest rate in the history of the city and 6.8 lower than the rate of 1922. If the infant mortality rate of 1923 had obtained for the last ten years, 2,106 more babies' lives would have been saved.

For the past three years a special attempt has been made in Newark to reduce the regularly high infant mortality rate among colored infants, which was as high as 140.8 in 1922, and is usually throughout the country two and three times the rate of white babies. In 1923 there were 712 colored births, with 80 deaths under one year and

33 deaths under one month, giving an infant mortality rate of 112.4 and a neonatal mortality rate of 46.3, while in 1922 there were 611 colored births, with 86 deaths under one year and 39 deaths under one month, giving an infant mortality rate of 140.8 and a neonatal mortality rate of 63.8. There has thus been a reduction of 28.4 or 20 per cent in the infant mortality rate, and of 17.5 or 27 per cent in the neonatal mortality rate within the last two years.

—From an article by Julius Levy, M. D., in Monthly Bulletin of the Department of Health, Newark, N. J., April, 1924.

Forward Steps in City and County

Joplin's Memorial Hall

JOPLIN, Mo.—The need of an auditorium or building of large seating capacity suitable for conventions, concerts and large public gatherings has for a long time been felt in Joplin. This need, together with a patriotic desire to provide a suitable memorial to the soldiers of the World War, resulted in an election favoring a bond issue of \$250,000 for the erection of a memorial hall, the principal feature of this hall to be an auditorium of large seating capacity. The local chapter of The American Legion, being largely responsible for the awakening of the patriotic spirit, was also responsible, in a large measure, for the passage of the bond issue.

Immediately after the bond election, the city Commission appointed a committee of representative citizens to secure a site and to choose an architect. Invitations to submit designs were sent to eleven leading architects of this section of the country, and six weeks' time was given in which to complete them.

These designs were submitted without names on them, a number being placed on each plan as it came in. The name of the submitting architect was sent in a sealed envelope, accompanying the plans, and this envelope was numbered corresponding to the number of the plan.

At the meeting of the committee to choose the successful design, a prominent architect, a specialist in analyzing plans, was called in to act in an advisory capacity. The accompanying view is a perspective of the chosen design. When the envelopes were opened, the winning architects were

found to be the firm of A. C. and A. S. Michaelis of Joplin.

The building is practically all taken up by the auditorium, which has 3,810 seats, 2,497 of which are on the first floor and 1,313 in the balcony, which extends around three sides. Entrance to the building is through a Memorial Vestibule, 20 feet wide and 60 feet long, thence through a lobby, 14 feet wide, into the auditorium proper.

In the Memorial Vestibule will be placed bronze tablets commemorating the soldiers and sailors who participated, not only in the World War, but in all wars in which the United States has been engaged. On either side of the vestibule is a ticket booth and check room, 14 x 20 feet. On the right side of the building is a women's reception room, 11 x 19 feet, and on the east side an office room, 10½ x 16 feet. At each side of the lobby is a carriage entrance from the outside and a stairway to the balcony.

The auditorium is 113 feet long and 140 feet wide. A center space, 94 x 89 feet, is to be built with a level floor and removable seats, to provide for balls, banquets and exhibitions. Around three sides are fixed seats in banks. The stage, 36 x 75 feet, is provided with modern appliances, and will accommodate large theatrical attractions. On the left side of the stage are dressing-rooms, the second floor above these being also provided with dressing-rooms. On the right side of the stage is a completely equipped kitchen with a conveniently arranged service room leading directly into the auditorium.

On the second floor, over the Memorial Vesti-



MEMORIAL HALL IN JOPLIN, MO.

bule, is a room 20 x 60 feet, to be used for meetings not requiring the use of the auditorium. On either side of this are two smaller rooms for committee meetings.

A tract of ground, 250 x 260 feet, has been purchased in what is practically the geographical center of the city. The cost of this tract was \$30,000; the cost of the building is to be \$200,000; and the furnishings will cost \$20,000.

O. R. MIT,
Assistant City Engineer.

Portable Tank for Street Shower

STAMFORD, CONN.—What has proved to be a very satisfactory type of street shower for the use of children in crowded districts was designed and constructed last summer by the Fire Department of this city. The shower, as shown in the accompanying photograph, is made on a concrete base, with a reducing joint which permits the connection of a fire-hose between the shower and a fire-hydrant. The shower-head is designed so as to give an equal distribution of spray immediately adjacent to the upright pipe, and at an expanse sufficient to cover a narrow street.

Four of these showers were used in the congested districts of this city during the summer months of last year, and by moving each shower from one locality to another after having been in operation for about one hour, eight sections of the city were served. A fifth shower was operated in another part of the city, near the home of one of the members of the Fire Department, who took charge of the shower during his off time.

The portable canvas tank shown in the illustration was devised by Fire Chief Veit, after the close of the shower-bath season last year and was constructed under his direction by members of the Department. The tank consists simply of a flat piece of canvas brought up on all four sides and supported by a pipe frame. It can be disassembled, folded and placed on a truck in a remarkably short space of time, and therefore will



STREET SHOWER AND PORTABLE CANVAS TANK DESIGNED AND CONSTRUCTED BY MEMBERS OF THE FIRE DEPARTMENT, STAMFORD, CONN.

not hinder the quick transfer of the shower from one point to another. Similar tanks will be provided for each shower used during the coming season, and it is expected that they will be received with enthusiasm by "our youngsters"!

ALFRED N. PHILLIPS, JR.,
Mayor.

A Municipal Building Erected in Units

CORONADO, CALIF.—The recently constructed fire and police station for the city of Coronado is an interesting example of the possibilities of erecting a public building in units. The architect's drawing reproduced herewith shows the entire building as it will look when completed. The two left wings of the building have already been constructed and are occupied by the Fire and Police Departments. The remaining section, when built, will be used as a new city hall.

The tearing down of the old fire station was begun in February, 1923, and the erection of the



MUNICIPAL BUILDING, CORONADO, CALIF., AS IT WILL LOOK WHEN COMPLETED
The two left wings have been completed and are occupied by the Fire and Police Departments

new building on the same site immediately followed. On August 1, the first unit, erected at a cost of \$25,015, was ready for occupancy. The ground area covered by this structure amounts to 5,460 square feet. The portion of the building housing the Fire Department's Seagrave truck, Dodge chemical and Cadillac ambulance is 45 feet square, with the Fire Chief's office, recreation room, firemen's sleeping quarters, baths, showers and kitchen on the second floor. The police station, including the Marshal's office, Sergeant's room and cell rooms, with the Fire Chief's apartments above, is 30 by 32 feet. To the rear of the fire station is a garage covering 45 by 55 feet. This garage is one of the most completely equipped of its kind, having a drill press, lathe and grinders, with a belt driven by 3-horse-power motion. A motor-driven air pump has also been installed. Here the repairs on all the equipment of the Fire, Street, Park and Sewer Departments are made. In the rear of the police station and adjacent to the garage is a concrete court, 30 by 55 feet, with a driveway to Orange Avenue.

Coronado is justly proud of this first unit of its public building.

T. J. ALLEN,
City Manager.

Handling Traffic at a Narrow, Congested Intersection

FLINT, MICH.—A rather unusual traffic signal is being successfully used on a congested intersection in Flint. A large amount of traffic moves over the intersection in all directions. Street cars occupy the center of one of the streets. The pavements are none too wide, making it practically impossible to have a police booth or other such obstruction within the intersection area.

Because of "driveways" from local automobile



**POLICE BOOTH FOR CONTROLLING TRAFFIC
SIGNAL**

factories and other out-of-town traffic at this point, it is necessary to maintain an officer there the entire day. It was suggested that the police booth could be located back of one of the intersecting sidewalks, and that from this booth a Stop and Go signal, located in the center of the intersection, could be operated underground. This suggestion was adopted, and a similar arrangement in Battle Creek was investigated.

The details of construction of this signal, worked out by the Engineering Department, are as follows:

A compact police booth, with removable windows and equipped with an electric heater and an electric fan (donated by the local electric service company) is located over a manhole off of the roadway on the least obstructed corner. The manhole is constructed of one length of 36-inch concrete pipe with an 8-inch tee branch. An ordinary cast iron manhole ring and cover closes the top.

From the 8-inch tee branch, an 8-inch tile line leads to a similar manhole of 20-inch tile, located in the center of the street between the street-car tracks. The top of this manhole is a standard cast iron, electrically lighted traffic guide furnished by the Elkhart Foundry and Machine Company. The handhole plate in the top of this traffic guide (for changing bulbs) was drilled to take a 1 1/4-inch pipe shaft for the Stop and Go signal. A branch electrical connection was also inserted in the top of the traffic guide.

In the street corner of the police booth is a simple lever handle, mounted on a shaft bearing on a steel plate in the bottom of the manhole below. This lever can operate only 90 degrees and always points in the direction of the "Go" traffic. Two stops are cut in the bar supporting the lever, and whenever the handle is lifted from the stops, a circuit is closed, ringing a warning bell mounted outside. Near the bottom on the shaft, opposite the 8-inch tee, is keyed an ordinary bicycle sprocket wheel. A duplicate sprocket is keyed on the shaft, carrying the Stop and Go signal in the street manhole. An ordinary bicycle chain is used around each sprocket, and the chains are connected with small flexible cables with turn-



TRAFFIC SIGNAL AT CONGESTED INTERSECTION

buckles for adjusting and tightening.

The street shaft is made up in sections. The lower section terminates about 2 inches below the surface of the traffic guide. The upper section, carrying the signal, is machined to fit and key into the bottom section, and operates as one continuous shaft. The upper section is wired with flexible electric cable to plug into the traffic guide fitting. This cable extends inside the shaft to a weather-proof conduit with a 40-watt bulb on top. This conduit is covered with a special Stop and Go sign, fitted with bull's-eyes. The bulb is directly behind these.

This entire top portion above the traffic guide is lifted out when the officer is not on duty, leaving the traffic guide lighted to indicate a dangerous corner. The hole in the top is closed with a loose steel plug.

The box-shaped Stop and Go sign was necessary because of the small space between street cars. It is made of light-weight galvanized iron, with a removable cover top to replace the bulb if necessary. The sides are painted bright red

and bright green, with large white letters.

As a matter of protection, the signal shaft was cut off just below the electrical connection, and a tight-fitting wood dowel used to rebuild it. It was expected that the signal would surely be run over and broken, since the police booth with the officer inside had met with that fate when he was located in the street. The traffic conditions are so much improved, however, that this has not happened after over a month's operation. If accidentally hit, the wood dowel will break and there will be no damage to any of the underground connections. The dowel and bulb can then be quickly replaced.

The signal is more than satisfactory, both to the police officers and to traffic. The details of the adjustable underground connections, the automatic warning signal, the wood dowel protection, the special signal, etc., were worked out, built, and installed by the Engineering Department of the city of Flint.

H. C. McCCLURE,
Consulting City Engineer.

Regulations for the Construction and Safeguarding of Piers and Wharves

ONE outstanding achievement of the National Fire Protection Association this year is the official adoption by its annual convention last month of regulations for the construction and safeguarding of piers and wharves, recommended by a special committee of which Charles H. Fischer, of New York, is chairman. In preparing the regulations the committee had the cooperation of the American Association of Port Authorities, American Concrete Institute, American Institute of Marine Underwriters, American Society of Civil Engineers, Maritime Association of the Port of New York, Railway Fire Protection Association, and Society of Terminal Engineers.

In a letter to THE AMERICAN CITY, the National Fire Protection Association says:

"Piers and wharves are the connecting link between land and water transportation systems. Their primary functions include furnishing shelter to vessels, stability during the loading and unloading processes, facilities for storing and classifying freight, means for the quick and economical transfer of freight to vessels and cars or vehicles, and facilities for handling passenger traffic. Aside from the influence that harbor conditions have on construction, the factors that have exerted the greatest influence on pier construction are the desire to satisfy the wishes of the operator, and the effort to design structures that can be built and repaired quickly, and comparatively cheaply, and which will result in a reasonable life for the pier.

"There is ample justification for urging upon owners and designers the need for applying modern principles for safeguarding fire hazards. The piers, wharves and vessels expose each other, and a fire in one endangers the other. Aside from the possible loss of goods, pier and vessels by fire, the important link between land and water transporta-

tion may be destroyed. Fire records covering a period of 34 years include reports on 169 fires resulting in a total loss of \$42,957,681, or an average of \$254,187 per fire. While it is admitted that this loss record is not complete and, therefore, is not a true index, it is the best and most complete record obtainable for this class of property. The average loss of \$254,187 per fire for the fires where the loss was given is the highest average loss recorded for any class of property.

"This is worthy of more than passing attention. It confirms most emphatically the feeling of fire department authorities and fire protection engineers that fires originating in piers and wharves, unless extinguished in the very early stages, develop into very serious losses. The reason for this feeling is found in the prevailing class of construction, viz., lightly constructed sheds of unprotected steel and corrugated iron or frame on open wooden piling, tremendous unbroken areas, inadequate protection, concentration of enormous values, a multiplicity of hazards, and frequently indifference of the operator.

"It is true that in some localities bottom and harbor conditions have prevented the more substantial and permanent construction, and will continue to do so until some genius perfects a design for substructures that will overcome these adverse conditions. Until such design is perfected, the best type of non-fire-resistive constructions is recommended by the N. F. P. A. committee. Requirements have been prepared which for pier construction, except for the walls, may be considered as approximating 'mill' construction for buildings. The basis for these regulations is found by the committee in the well-established fundamentals for safeguarding ordinary buildings against the fire hazard, in so far as they are applicable to piers and wharves."

Adding Great Beauty to the City Fountain at a Relatively Small Cost

By R. G. Bellezza

General Electric Company

ORNAMENTAL fountains, such as are now in operation in hundreds of cities and towns, can be illuminated in such a way as to make them objects of indescribable beauty at a cost well within the means of most communities, even small ones.

This is proved by what has been done in the case of the Schute fountain on the city common at Lynn, Mass. This fountain consists of one central and four surrounding groups of jets, an arrangement not dissimilar from that of any number of others. As a matter of fact, the lighting system devised for it can be applied to practically any distribution of nozzles and streams.

In illuminating fountains the method usually followed has been to throw beams of light upon the jets from arc lamps or floodlights installed in a glass-enclosed room beneath; the colors are provided by the use of glass color screens over the lamps, these screens being changed by hand or mechanically.

In the Lynn fountain, the expensive expedient of an underground chamber has been avoided by raising the piping 28 inches above the floor of the fountain and placing beneath each jet and ring, floodlights made of waterproof material sealed so as to be water-tight, each equipped with a colored glass door. Both the jets and the lights are operated manually from a small building a few feet from the fountain. Automatic control can be arranged if desired, or a combination of manual and automatic control can be effected.

The battery is composed of 30 varicolored floodlights, consisting of five groups of six each, each group having the colors red, white, blue, green and amber, with purple or vermilion supplying the sixth color as desired. A 500-watt lamp is used in all except the blue and green units, in which a 1,000-watt lamp is employed. A 1,000-watt lamp is used, also, in each unit in the center of each group. The average load while the fountain is in operation is 10 kw., which indicates the low cost of the illumination.

Through a window in the control house, the operator can observe the results of the combinations of colors and water. Each light is operated by a snap switch, with the color it

controls indicated, and a great variety of combinations may be had by a proper manipulation of the switches. The water is controlled by quick-acting valves on the wall of the control house. One man, seated, is able to run the complete display with ease.

The Pool and Fountain

The pool in which the fountain operates is about 70 feet in diameter. It is 9 inches deep at its outer edge and slopes down to 3 feet deep below the ground level at the base of the fountain proper. The distance from the outer edge of the pool to the base of the slope is 21 feet. The slope for the drain-off from the fountain is approximately 45 degrees up to the floor of the fountain, which is on about the same level as the ground.

The fountain is 18 feet in diameter and is surrounded by a wall about 4 feet high, with jagged points protruding approximately a foot higher, the wall being 2 feet thick. Small holes are left in the lower part for the drain-off to the pool. The floor of the fountain is covered with concrete, the center being about 6 inches above the circumference. The entire pool, fountain floor and walls are wholly or partially concrete. The drain-off for the pool is a perforated pipe extending 6 inches above the floor of the pool at the base of the fountain, and there is an overflow outlet in the 9-inch wall at the outer edge of the pool. This outlet can be so regulated as to keep the pool full of water at all times.

Water Installation

The fountain proper consists of a center ring and four outer rings, each 25 inches in diameter from center to center of the brass piping, which is 2 inches in diameter, brass being used as the best material for this purpose. The outer rings are equally spaced and centered on the circumference of a circle whose radius is 66 inches.

Each of these rings has holes about 1/16-inch in diameter in the center of the top of the pipe, about 2 inches apart on the circumference, which give a spray effect to the water. In the center of each outer ring, as well as in the center ring, there is a spout extending



ELECTRIC FOUNTAIN ON THE CITY COMMON, LYNN, MASS.,
ILLUMINATED AT NIGHT



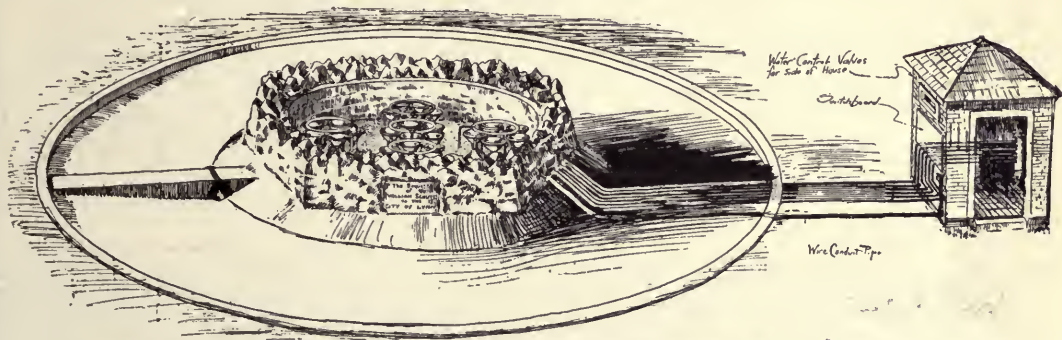
ANOTHER OF THE NUMBERLESS COMBINATIONS OF WATER
EFFECTS AND COLORS IN THE LYNN FOUNTAIN

about a foot above the rings with a $\frac{3}{8}$ -inch nozzle. The center nozzle is independently controlled, while the outer nozzles are all under one control. Each can throw a solid stream of water into the air to a height of about 25 feet. With the center ring there is also a separately controlled spray, which may be replaced by a whirling spray if desired.

The outer rings are all fed from the center by a $2\frac{1}{2}$ -inch main which goes back to the control house. The nozzles are likewise fed from the center by a 2-inch main, while the center nozzle spray and center ring are each separately piped to the control house through $1\frac{1}{2}$ -inch mains. All the feeder pipes are bent to the level of the floor before they go through the wall of the fountain, and follow the con-

reflectors are used with the others, a total of seventeen.

Both jets and lights are operated from the control house, close by the fountain. All pipes and wire conduits lead into the control house through the floor. The pipes are run into a 6-inch header, with a quick-acting, long-handled valve in each main. This header is connected directly to the lead-in main from the city supply by a globe valve. The wires come into a control box with fuses in each circuit, and each lamp is connected through, and controlled by, a button on top of the control box. The position of these buttons on the control board is the same as the position of the floodlights in the fountain. Beneath each button is a card indicating the color it controls. The control



SCHEME OF ILLUMINATION OF FOUNTAIN, SHOWING ARRANGEMENT OF LUMINARIES AND CONTROLS

tour of the slope and pool on the surface, entering the ground through the outer wall of the pool and then up into the header in the control house. The piping is covered over from its exit through the wall to its entrance in the ground with a concrete box, which protects the pipes from breakage.

Electric Installation

Each ring, including the center one, has a battery of six General Electric Company floodlights, Type L-1 special, placed under it, the piping being raised, as stated, 28 inches above the floor of the fountain. Each floodlight is of a certain color, the color being obtained by means of a colored door glass, the different colors being blown in the heat-resisting glass so as to be permanent. A floodlight is placed under the center of each ring, and five others are installed as close to the center one as possible, spaced equally around the ring. Silvered reflectors are used with the units in the center of the rings and with the blue and green units, thirteen in all. Aluminum

is so flexible that any combination of colors may be obtained in each group.

Approximate Cost

Obviously, an estimate of the cost of illuminating a fountain in this manner can at best be only approximate, the price of material and labor varying, and the distance between the fountain and the control house affecting it to some extent. The following figures are general, but indicate the comparatively small expenditure required. They are, of course, exclusive of the cost of the fountain itself, walls, overflow basin and drains:

	Labor	Materials	Total
Electrical work	\$329.54	\$149.10	\$478.64
Piping	307.72	170.64	478.36
Erection work	257.80	132.44	390.24
Lead-in from water-main approximately 50 feet. (This item would of course vary in different installations)	350.00	.....	350.00
Cost of brass piping ...	.....	250.00	250.00
Cost of floodlights ....	.....	937.50	937.50
Cost of colored glass doors .....	.....	43.75	43.75
Cost of lamps Type C Mazda .....	.....	178.25	178.25
	<u>\$1,245.06</u>	<u>\$1,861.63</u>	<u>\$3,106.74</u>

Thus, for the sum of, say, from \$3,000 to \$3,500, a city which already has a fountain can turn it into a thing of such surpassing beauty that it will attract attention and admiration from far and wide. When the Lynn fountain was first operated, after having been equipped with the lighting and control equipment described above, crowds of upwards of 15,000, residents of Lynn and of other cities in that vicinity, flocked to the common to see it.

Words cannot describe the marvelous changes in this fountain, from jets turned down and lighted with amber light until the fountain looks like a waving field of ripening wheat, to a crimson pyramid that looks for all the world like a huge bonfire, and with numberless combinations of colors and effects between. Only by an actual view of the fountain in operation can its beauties and possibilities be realized.

The Aftermath of the Berkeley Fire

By Carol Aronovici

City Planning Consultant

THE saying that a good fire is a blessing to a community has no point when we consider what has happened in Berkeley, Calif., since last September, when 539 houses were destroyed by fire with a loss of real and personal property amounting to some \$10,000,000. From the fact that the district was

badly laid out and that there was need for some diagonal streets, street widenings, setback lines and other improvements, every obstacle to which was removed by the fire, it was hoped that the carrying out of these much-needed improvements would result.

The City Planning Commission and the City



Photograph by courtesy of the "Industrial Fire Chief"—Copyright

BERKELEY'S DISASTER—AND OPPORTUNITY—AFTER THE CONFLAGRATION LAST SEPTEMBER
The campus of the University of California is in the background on the right

Council immediately after the fire took steps to re-zone the district, which covered about a square mile, and to suggest certain changes in the arrangement of the streets so as to forestall any building along old lines and to give the district a residential character.

The Difficulties

Perhaps the simplest way to describe the difficulties that arose when these improvements were attempted will be to enumerate them in the order of their importance:

1. The burnt area was occupied by homes of rather high-grade character, but they were largely owned by persons connected with the University, and various professional and business men of comparatively limited means.

2. The proximity of the district to the University afforded an opportunity for the building of multiple dwellings and rooming-houses that could accommodate some of the low-salaried members of the faculty and the families of students whose parents had come to the University for the period required for the completion of the education of their children.

3. The insurance on many of the properties was based upon old costs which were entirely inadequate for the replacing of the buildings in accordance with the standards that existed prior to the fire.

4. The University gave support to the idea that more accommodations were necessary for the students, and that the district in question was too near the University to be devoted entirely to single-family residences.

5. The opportunity for acquiring lands in some other districts at a lower cost than the value of the lots in the burnt area, prompted many owners to dispose of their property for speculative purposes and to acquire land in more definitely fixed residential districts than the one in question.

6. The City Council and the various officials connected with the city government within whose jurisdiction the question of zoning and planning rested, could not face the criticism that would have arisen from the maintenance of the high standard of control.

7. The development of diagonal streets involves considerable expense, and with \$5,000,000 of taxable property removed and many personal losses incurred by property owners, it seemed difficult to press any improvements involving large expenditures.

The Results

Under these conditions the results were as follows:

1. The burnt area, located at points where a grade would not ordinarily be a factor, was zoned for multiple dwellings, rooming-houses and fraternity houses.

2. A small fringe of two-family houses was established as a buffer line between the multiple-dwelling district and the single-family residential district which was established in the hilly area. Up to the time of the fire there was no single-family residence zone in that area.

3. A uniform 5-foot setback line was established throughout the entire fire district, making it possible at some future date to widen the streets, when such widenings shall become necessary.

4. In view of the fact that the vegetation on most of the streets was practically all destroyed during the fire, and that multiple dwellings are being constructed in large numbers, it must be stated with regret that Berkeley has lost a considerable portion of one of the most charming residential sections within easy reach of the University of California and contiguous to the business sections of the city.

With the exception of the 5-foot setback line and the establishment of a one-family district on the hills overlooking the campus and the San Francisco Bay, there was no accomplishment from the point of view of city planning, and much of what is being built is of a comparatively low standard of architectural design.

Fire Protection Lessons from the Berkeley Fire

EDITORIAL NOTE.—In the foregoing article Dr. Aronovici discusses the aftermath of the Berkeley fire from the point of view of the city planner. The chief fire protection needs of Berkeley, to prevent such a conflagration from occurring again—needs which exist in too many other cities also—were summed up for the City Managers' Association at its last convention by R. E. McDonnell, consulting engineer, as follows:

1. Fire-resisting roofing materials.
2. Mains and feeders sufficiently large and gridironed to give adequate water pressure.
3. Elimination of dead ends and mains smaller than 6-inch.
4. Closer spacing of fire-hydrants—at least two at congested intersections and at not less than a block apart in residential districts.
5. A closer cooperation and mutual understanding as to just what neighboring fire departments should do in such emergencies.
6. A better education and knowledge of the public as to fire detection, fire protection, fire prevention.
7. Strict enforcement and aid in enforcement of all ordinances.



THE GARDEN CITY OF KONAKRY, GUINEA

French Colonial Cities Laid Out Like Garden Cities

By **Georges Benoit-Levy**
Director, Garden City Association of France

EDITORIAL NOTE.—*The following brief account, in M. Benoit-Lévy's own words, of garden city developments in France's African colonies, has been written in English for the special benefit of THE AMERICAN CITY'S readers, by the Director of the Association des Cités Jardins de France.*

FRANCE is at her best in her colonies. Most of the time the French made friends with the natives, and the French colonial empire is, one may say, a great league of friendship between the metropolitan and the vernacular races. One feels that harmony between civilizations of so various an origin, principally in the way some of the French colonial towns have been laid out.

Recently when Morocco was to be organized, one of the first men to be called by the Sultan, on advice of Maréchal Lyantey, was Prost, the best town planner of France. Either the army, under such guidance as Colonel Landais, built new towns like Taza which cause the admiration of every visitor. At Madagascar we find one of the best hydro-resorts of the world, named Antsirabé, entirely laid out on the principles of the garden cities by the architect Cassaigne. But, where the contrast is the most striking, is in the opposition of a French colonial town as old as Saint Paul (Reunion Islands), founded 1655, and Konakry (Guinea), founded 1891.

The photograph here shown indicates the delicate meddling of nature and structure of gardens and houses.

St. Paul was the first spot inhabited when French colonists coming from Fort Dauphin (Madagascar) settled there in 1665. It is now a town of 20,000 inhabitants, situated around a sheltered bay. The climate is dry and wholesome. Not far from the town one finds an underground lake and a little further, the well-known landscape of Bernica, sung by Leconte de Lisle and George Sand.

Konakry, built in the brush by Doctor Ballay, the first governor of Guinea, in 1891, is a town of 10,000 inhabitants, of which 500 are Europeans. It is erected on the island of Tumba and connected to the continent by a levee supporting the road and the rail which go towards the Niger. Large roads in the four directions of the compass allow everywhere the cooling effects of the sea breeze. The houses are delightfully built amongst mango and other tropical trees, surrounded by numerous fountains.

These refreshing views will act as a rest after the usual drying effect of regular town planning discussions, and remind some of the sweetest American colonial towns at the time of Uncle Tom Cabin.

Limitations of Bituminous Surface Treatments and Bituminous Macadam Pavements Under Modern Traffic

By I. W. Patterson

Chief Engineer, Rhode Island State Board of Public Roads

IN studying bituminous surface treatments and bituminous macadam pavements in the United States, one is particularly impressed by the lack of uniformity in results secured. This fact, of course, tends to prove the contention that there has been no well-developed technique advanced for the construction and maintenance of these types of surfaces. In certain localities, we find almost complete failure attending attempts to maintain economically under modern traffic surfaces of both types. In close proximity to these localities we frequently find marked success attending the maintenance under modern traffic of one or both of these types of surfaces. It is believed by the writer that there are no other types of surfaces which have produced more variable results under modern traffic than have the two types covered by this paper.

The aim of the writer in the treatment of this subject is, first, to discuss the service rendered by both types of surfaces under modern traffic, and, second, to point out certain unfortunate circumstances surrounding the construction and maintenance of these surfaces which, perhaps, may account for the extremely variable results which are so apparent.

Bituminous Surface Treatments

Bituminous surface treatments are applied to many types of road. Earth, sand-clay, gravel and macadam are some of the surfacing materials to which bitumen is applied extensively. Surface treatments are also applied to roads of each type which are in variable condition and which are surfaced with materials far from uniform in quality. It would appear, therefore, that a discussion of the limitations of bituminous surface treatments necessarily must include a discussion of the influence of various types of roads in various conditions upon the probable success of surface treatments.

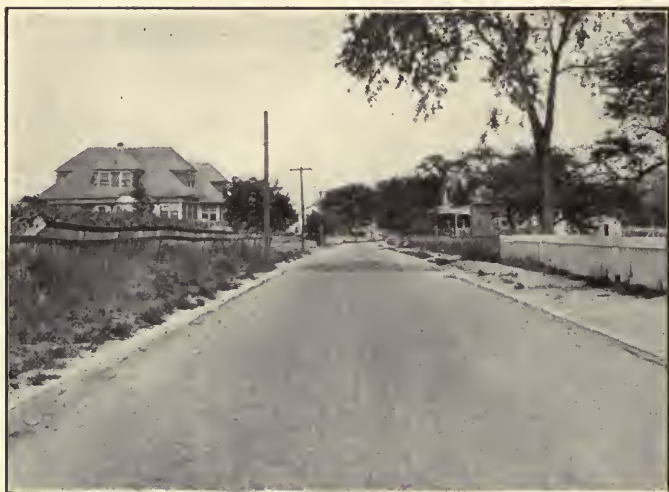
It may be questioned seriously if sufficient attention has been devoted to the problem of correlating surface treatment to the type and condition of the road. A great deal of the written matter pertaining to this subject has to do primarily with the virtue of bituminous

The Problem

Treatment of this subject in a concise and comprehensive manner is made rather difficult because of the fact that there appears to be insufficient standardization in the construction and maintenance of surfaces of these types. In certain isolated localities, of course, both selection of materials and methods of construction and maintenance have been standardized more or less as a result of local experiment, but we fail to find sound, uniform practice developed as a result of intensive scientific research and adopted generally throughout the United States.

Not only is standardization in practice lacking, but there appears to be a decided lack of a well-developed technique surrounding the construction and maintenance of both types of roads under discussion. It would appear perhaps, that the wide-spread demand for higher types of surfaces has resulted in concentration of technical effort upon the solution of the many problems involved by the higher types, to the detriment of the less expensive types. In studying the written information pertaining to these surfaces one must be impressed by the facts that many of the fundamentals of both types of surfaces have not been studied intensively and that a sufficient amount of research has not been devoted to roads of these types. The comparatively sound practice of building or of maintaining these roads which is found locally, well may be considered to exemplify the need for intensive scientific study aimed to eliminate the many indeterminates encountered by the engineer in his attempt to solve the problems incident to establishing a rational practice controlling these types.

A third feature which tends to make it difficult for a student of this subject to arrive at definite conclusions is the tendency in many localities to replace surfaces of both types by more expensive surfaces, not always perhaps with due regard to securing the ultimate economical life from the cheaper types. Popular enthusiasm for good roads in some localities seems to have resulted in popular disapproval of types of surfaces of the so-called cheaper classes.



NEWLY COMPLETED BITUMINOUS MACADAM PAVEMENT, SHOWING TYPICAL CHIPPED STONE FINISH WHICH EXISTS FOR A SHORT TIME ONLY, FOLLOWING CONSTRUCTION

materials of various types employed for surface treatment. It is apparent that the character of surfaces to be treated has a decided influence upon the results obtained from surface treatment with bitumens. In view of the tremendous amount of bituminous surface treatment accomplished annually in the United States, it would appear perhaps that there is a decided need for research aimed to eliminate some of the many indeterminates encountered by engineers in this particular phase of work, especially in regard to the correlation of the material to the character and condition of the road.

How to Increase the Effectiveness of Surface Treatments

Bituminous surface treatments in general appear to be more effective when applied to surfaces consisting in large part of coarse, granular material. A large percentage of fine particles in the material composing a road does not appear to be conducive to the success of bituminous surface treatment. It is a matter of common knowledge, of course, that the surface treatment with bitumen of earth roads and sand-clay roads ordinarily does not produce excellent results. Except upon the ground of expediency, therefore, it is doubtful if bituminous surface treatment should be applied to roads of these types. As compared with other methods of maintenance, it is doubtful if treatment of earth and sand-clay roads with bitumen adds sufficiently to the service of such roads to justify the expense. This is particularly true in the North, where the effect of frost frequently is

serious upon roads of these types; provided they carry a considerable amount of traffic during the spring thaws.

Gravel roads have been surface-treated with bitumen successfully for many years. Observation of results secured from bituminous surface treatment of gravel roads appears to justify the statement that the character of the gravel has a great deal to do with the success of surface treatment and should have a great deal to do with the selection of the material for surface treatment. Some of the so-called natural road-building gravels, containing a considerable amount of fine material which serves as a binder, do not respond well to

treatments with certain bituminous materials which give excellent results when applied to coarse gravel, which demands wetting and rolling in order to secure proper consolidation.

In New England, where state road building began at a very early date, some of the state highway systems were surfaced originally in considerable part with gravel. Funds have not been forthcoming in sufficient amount to replace these surfaces as the traffic has increased. We find in New England, therefore, a large mileage of gravel surfaces subjected to fairly heavy traffic.

Experience in New England appears to indicate that, aside from the dust nuisance, an untreated gravel road may carry successfully and economically a traffic as great as 500 vehicles per day. If traffic of several thousand vehicles per day passes over gravel roads, the experience in New England appears to indicate that surface treatment is advisable. There is to be found in New England a considerable mileage of gravel roads, surface-treated with bitumen, which carries between 2,000 and 2,500 vehicles per day during about seven months of the year at a total cost of maintenance of approximately \$1,400 per mile per year. These roads in large part render an excellent service to traffic and there seems to be no well-founded objection to these roads, except, perhaps, upon the ground of their high cost of maintenance.

In discussing the economy of these roads, we must consider first that the building of the roads, involving as it did a comparatively low initial cost, has provided facilities for traffic

far greater than could have been provided if more expensive types only had been selected. In a great many cases also the annual cost of maintenance is no greater than the annual interest upon the investment for some of the more expensive types of surfaces plus the annual maintenance cost of the more expensive types. A study of the economy is, of course, incomplete without consideration of the service rendered by the roads. Well-maintained gravel surfaces are popular with the motoring public in a considerable portion of New England, simply because these roads are maintained in good condition at all times. There appears to be insufficient ground for criticism, therefore, that the service rendered by gravel roads in New England in general is not economical.

Effects of Truck Traffic and Frost

In some localities in New England, it has been noted that truck traffic is decidedly detrimental to gravel roads surface-treated with bitumen. This seems to be especially true during the spring thaws when the roads are in their weakest condition. In the cases of roads carrying between 2,000 and 2,500 vehicles per day, therefore, it may be questioned if economical service from gravel roads will follow if truck traffic constitutes a large percentage of the total traffic. Definite information permitting an accurate estimate of the amount of truck traffic which a gravel road will stand successfully is lacking. It is the opinion of a number of New England engineers, however, that a percentage of truck traffic to the total traffic in excess of 5 per cent causes considerable injury to surface-treated gravel roads subjected to a total traffic of from 2,000 to 2,500 vehicles per day.

Since the alleged inability of gravel roads to stand up under the combined effect of traffic and of frost action sometimes is considered to be the limiting feature of the service rendered by gravel roads, the effect of frost, perhaps, is worthy of special mention. We observe frequently gravel roads subjected to traffic throughout the entire year which are affected by frost to a negligible degree, and we observe, on the other hand, instances of serious rutting and heaving of gravel roads both untreated and

treated with bitumen. Excessive destructive effect of frost action upon gravel roads in many cases may be attributed directly to peculiarities of the subsoil below the gravel surface. In some cases, however, it is reasonable to presume that the type of gravel has a considerable influence upon the effect of frost.

Excess of fine material in the gravel tends to promote capillarity in the gravel and thereby to intensify the effect of frost action within the layer of gravel. A study of gravel suitable for use in the construction of gravel roads should include a study of the capillarity of the material. In some sections, the separate deposits of gravel available for road building are very uniform in character. In other sections, however, gravel is extremely variable in character, permitting selection of the better qualities. Excessive frost action may be so serious in its effect upon the service rendered by gravel roads that it is worth while to do more than is done generally to attempt to eliminate frost action so far as is economical and practicable.

How Much Traffic Can Be Handled

Although we find instances of traffic over gravel roads exceeding 2,500 vehicles per day, it is doubtful if surface-treated gravel is economical for traffic any greater. It is true, of course, that some types of gravel cannot carry economically when surface-treated with bitumen a traffic as great as 2,500 vehicles per day.

The lack of uniformity in results obtained from the surface treatments of gravel pro-



WELL-BONDED MOSAIC SURFACE OF BITUMINOUS MACADAM PAVEMENT IMMEDIATELY AFTER CHIPPED STONE COVER HAS WORN OFF

Under traffic the surface gradually becomes smoother until the mosaic effect disappears. Note wide painted strip in center of highway to control traffic



**SURFACE-TREATED MACADAM ON THE NEW-LONDON TURNPIKE,
RHODE ISLAND**

vides an almost insurmountable obstacle to a successful attempt to state specifically how much traffic roads of this type can carry successfully. It may be questioned if the features influencing the selection of gravel for the construction of gravel roads perhaps have not in usual practice been confined to the features productive of the best results untreated. There is some reason to doubt whether or not the best results from bituminous surface treatment of gravel roads follow from the use of gravel in the construction of the road which gives the best results untreated. This feature is believed to be worthy of a more intensive study than has yet been made of it.

Surface Treatment of Macadam

Surface treatment of macadam roads offers a problem somewhat different from the problem of surface treatment of the types mentioned previously. A macadam surface ordinarily is more readily freed from fine particles interfering with the success of surface treatment, and the structure of a macadam road also is more rigid than the structures of the types mentioned previously, except, perhaps, the better class of gravel roads. Surface treatment of macadam roads is a practice which has been in vogue in municipalities and upon state highway systems for a long time. Macadam surfaces lend themselves to treatment with heavy materials more readily than do the types mentioned previously. In some sections, the success attending the surface treatment of macadam surfaces with bitumen considerably heavier than ordinarily is considered suitable for work of this class provides a very interesting study.

The value of a so-called priming coat, em-

ployed initially upon macadam surfaces which have not been surface-treated with bitumen previously, also is an interesting phase of the problem of surface-treating macadam roads. Unusually good results have been secured by the use of a light priming coat, followed after a few weeks by a heavy material which could not well be used for the initial application. The use of the heavier materials at intervals of several years, rather than the use of lighter materials each year, with the exception, perhaps, of one year in three, perhaps is worthy of greater study than yet has been devoted to it.

As in the case of gravel roads, we find that results from bituminous surface treatment of macadam roads vary greatly. In southern New England, comprehensive systems of state roads were built during the period in which macadam roads were considered to be the best roads possible to build in rural sections. The problem of maintaining these roads, many of which were built before the beginning of the present century, has been a difficult problem to solve. Surface-treated macadam roads have given very good service in southern New England at a cost in the neighborhood of \$1,200 per mile per year under traffic between 2,500 and 3,000 vehicles per day during seven months of each year.

In the case of macadam roads, resurfacing with a higher type of top is not as expensive an undertaking as is the case with the types of surfaces mentioned previously. For that reason, perhaps, it may be questioned if it is economy to surface-treat gravel roads carrying a traffic in excess of 2,000 vehicles per day, unless it is financially impossible to resurface them.

Macadam roads also are affected by frost action, especially when they are called upon to carry a fairly heavy traffic during the spring thaws. The effect of frost action upon a macadam road should be considered in planning the surface treatment. The better classes of surface treatment may well be considered out of order in the case of macadam roads which are seriously affected by frost action, simply because the surfaces inevitably will be destroyed during the spring months. If it is impossible to carry out preventive measures aimed to eliminate frost action, there-

fore, it is believed the cheaper treatments are more economical in the end.

Surface treatment of some of the higher types of bituminous pavements is a maintenance measure. The surface treatment of bituminous macadam roads is considered later in this paper.

The surface treatment of bituminous concretes is resorted to periodically as a method of restoring the surface. This class of work, within the scope of this topic, apparently should be limited only to a discussion of the efficacy of surface treatment of bituminous concrete pavements as compared with the plan of eliminating surface treatments and resurfacing or completely replacing the bituminous concrete surface when the wear necessitates it. Judicious surface treatment of bituminous concrete pavements places the pavement in substantially as good condition as it was originally, unless there is some fundamental fault inherent in the pavement. Perhaps, therefore, we are justified in stating that the traffic limitations of a surface treatment applied to bituminous concrete pavements are identical with the traffic limitations of that class of pavement.

Bituminous Macadam

The practice of constructing and maintaining bituminous macadam pavements is extremely variable. In discussing pavements of this type, therefore, we must not presume that we are discussing a type of pavement which is standardized in construction and in maintenance to the extent to which many of the higher types are standardized. We find numerous instances of dismal failure of bituminous macadam pavements under comparatively light traffic. Upon the other hand, we find certain instances of the rendering of very economical service of pavements of this class under heavy traffic. In connection with a discussion of the traffic limitations of this class of pavement, therefore, the lack of standardization and the lack of uniformity in results secured present difficult problems.

Our results with bituminous macadam in Rhode Island fail to disclose any definite relationship between volume of traffic and cost of maintenance. This indicates that features of design, construction and maintenance

are of tremendous importance, so far as service rendered by the pavements is concerned. In our attempt to determine the limitation of bituminous macadam upon our state highway system in Rhode Island, we are very frequently confronted by paradoxes, such as the lowest maintenance costs upon the projects carrying the greatest traffic. This study, however, leads us to the conclusion that bituminous macadam pavements are capable of standing very heavy traffic, provided an intensive study of these pavements succeeds in eliminating a number of very common faults both in connection with construction and in connection with maintenance. The following table of costs of our bituminous macadam pavements may be of interest:

Year of Construction	Prevailing Width of Pavement	Average Cost of Pavement per Mile*	Average Maintenance Cost per Mile of Pavement per Year Since Construction†
	Feet		
1913	14	\$ 7,660.27	\$153.35
1915	18	8,417.65	112.82
1916	18	12,067.83	217.01
1917	18	17,207.83	186.85
1918	18	18,333.53	114.35
1919	18	18,616.07	103.04
1920	18	23,730.64	31.33

*Cost of pavement only, exclusive of costs of grading, foundations and drainage.

†Cost of maintenance of pavement only.

Two of the sections built in 1913 were resurfacing projects over old macadam. These sections were replaced during 1923. Except for this replacement of two very cheap jobs, all of our bituminous macadam is carrying traffic successfully.

Progressive corrugation of the surfaces of



BITUMINOUS MACADAM PAVEMENT SEVEN YEARS OLD
This picture shows the close-packed surface resulting from traffic. Reappearance of mosaic surface in Rhode Island practice is considered to be a preliminary indication of the need for resealing

bituminous macadam is considered by some to be the most serious feature limiting the service rendered by these pavements. It is true that this fault is much in evidence in many sections. This fault, however, is believed not to be inherent in pavements of this class, but due rather to unfortunate selection of materials or to unfortunate features incident to construction.

The bituminous macadam pavements upon the state highway system of Rhode Island are called upon to carry traffic varying from approximately 1,000 vehicles of all classes per day to traffic of approximately 7,000 vehicles of all classes per day during seven months of each year. Since our state is primarily industrial throughout and since our population is dense, the traffic over our roads is heavy during the winter months. Snow removal upon all state roads is considered in our state to be absolutely essential, and is carried out. Of this total traffic, motor trucks constitute from 200 to 600 vehicles per day, and this traffic varies little with the seasons.

As an indication that refinement of method of construction and maintenance perhaps is of the greatest importance in the case of bituminous macadam pavements, it is interesting to note the cost of maintenance of the projects completed during very recent years with the costs of maintenance of the projects completed previously. For three years following 1916, the bituminous macadam pavements constructed during that year cost an average of \$77.50 per mile per year for maintenance. The projects constructed during 1920 cost during the following three years for maintenance an average of \$31.33 per mile per year. Traffic over the state roads of Rhode Island increased greatly during the period from 1916 to 1920, and this illustration is offered of the possibilities afforded for the development of rational methods of construction of bituminous macadam pavements, to the end that the very common faults of these pavements may be eliminated. The lower maintenance cost of the projects completed in 1920, we believe, is attributable only to greater care in connection with the innumerable details of construction.

Questionable methods of maintenance also account for a great deal of variation in results secured from the use of bituminous macadam pavements. It is the practice in Rhode Island to reduce the number of resealing operations to a minimum. Progressive corrugation of bituminous macadam pavements is stimulated greatly by the application of excess of bitumen upon the surface.

In our practice of maintenance, therefore, local resealing only is resorted to until a large percentage of the total area displays evidence of a need for resealing. Several of the projects constructed in 1913 have not yet been resealed, except locally. Under our plan of maintenance of bituminous macadam pavements, the materials and methods employed in original construction are adhered to strictly. This practice is followed because of our belief that it promotes the preservation of uniformity of the surface and thereby adds to the economical life of the pavement. We do not favor any plan of maintenance which tends toward lack of uniformity of surface.

Apparently, we must consider that resealing of bituminous macadam surfaces is a necessity sooner or later. In planning such surface treatments, however, the greatest care must be taken both in regard to selection of materials and in regard to the methods and amounts of application. Surface treatment of bituminous macadam pavements judiciously carried out restores these pavements to their original condition very effectively.

Foundation weakness many times limits directly the service rendered by bituminous macadam pavements. The structural strength of such pavements is negligible, so it cannot be presumed that the pavements are capable of carrying traffic successfully over unstable subsoil without careful attention to the foundation problem. It is true, however, that these pavements are capable of withstanding, without apparent serious damage, considerable distortion due to frost action. For that reason, it is not necessary in the design to eliminate absolutely all effect of frost action upon the pavement. So-called insulating layers of permeable material directly below the pavement have been found to be very effective over heavy, retentive subsoil.

It is also essential to make a careful study of the problem of the correlation of the binder to the quality of crushed stone. Binders which produce excellent results with certain rock give mediocre or even poor results when combined with other types of rock. Research into this phase of bituminous macadam pavements, perhaps, would result in the elimination of much of the variation in results secured at present.

So far as our results in Rhode Island are concerned, it appears that bituminous macadam pavements 18 feet or 20 feet in width will render economical service when subjected to traffic in excess of 5,000 vehicles per day.

ACKNOWLEDGMENT.—From a paper read before the Tenth Annual Conference on Highway Engineering, University of Michigan.

Oxyacetylene Welding and Cutting in a Water-Works Department

Municipal Plant at Bloomington, Ill., Makes Appreciable Savings

A MUNICIPAL water-supply power-plant is quite similar to any other modern power-plant with the exception that much of the equipment is spread over the entire territory supplied with water. Consequently, any process which can be employed economically for maintenance and repairs must be portable. The use of oxyacetylene welding equipment has been successfully demonstrated in the plant and field in the city water-works of Bloomington, Ill., according to C. C. Williams, Superintendent of Water and Light.

The use of the equipment is about equally divided between welding and cutting. Most of the repair welding is done in a welding shop, a section of the old blacksmith shop, where adequate facilities are provided for preheating, cooling and conveniently handling the work according to recommended good practice. Nearly every day some part of the pumping machinery, boiler room or building equipment is repaired with the use of this equipment, according to *Oxy-Acetylene Tips*. Often it is a small part requiring only a few minutes to weld or braze, but there are numerous occasions when, in an emergency, the welder is called upon to repair some major part and thus saves a long shut-down, besides saving an appreciable difference between the cost of such a repair and the cost of a new part.

In the field one of the first uses of the welding blowpipe was for melting out lead joints in cast-iron water-supply pipe lines. The lead is so removed that it can all be salvaged. A large sum of money has been saved by the department through the use of oxyacetylene equipment in melting out lead joints of water pipes alone.

An item of expense chargeable against automobile traffic and one which would approach larger proportions were it not for the welding shop, involves the salvage and repair of hydrants. An average of one of these is broken each month by automobiles or trucks colliding with them. There are times when such an accident will so shatter a cast-iron hydrant that it is beyond repair, but in the



HYDRANT RECLAIMED BY WELDING

majority of cases broken hydrants are repaired in the welding shop in about one hour and at a cost of about one-fifth of that of a new stand-pipe. Frequently hydrant heads require replacement. It is very easy to cut off the old threads and weld on a new threaded cast-iron section, thus saving replacing the entire upper casing.

The plant has a well-equipped machine shop and other facilities to make it independent of outside sources for minor repair parts, plant appliances, etc. Numerous parts are made for the boiler, stokers and boiler room equipment. The cutting blowpipe is used almost exclusively to cut and to shape these. It is notable that in making repairs to the stoker equipment and on the boilers, otherwise inaccessible parts can be reached and cut out with a cutting blowpipe.

The cutting process is used extensively in the field on revisions and additions to the water line. Such work is often of an emergency nature, and then the speed which the cutting blowpipe lends to the work is especially valuable, as it is obviously essential to interrupt the water-supply only a minimum length of time.

Of more recent development is the use of the cutting blowpipe to cut cast-iron pipe. Formerly it often required about a day for two or three men to cut a section of large cast-iron pipe. Now, however, such cutting is accomplished with an oxyacetylene blowpipe in less than an hour's time, even on cast-

iron pipe of large diameter. In order to install a new valve on a 20-inch diameter cast-iron line having a 1-inch wall, two cuts were recently made in the pipe, and the new valve was installed. The work was completed in half a day. The management of the water department has worked on the principle that whenever metal is to be joined or cut, the oxyacetylene process can be advantageously employed. According to Mr. Williams, the uses to which they have satisfactorily and beneficially employed welding and cutting

testify to the soundness of the principle. The application of welding and cutting in a water-works is similar to that in other industries. Only the size of the plant limits the extent to which the process may be used. The Bloomington water-works has a daily capacity of 10,000,000 gallons of water and is typical of plants in other cities of about 30,000 population. The economies which have been derived through the use of this process are likewise typical of what many other similar works can accomplish.

Regulating Automobile Parking for Benefit of Street Cleaning

An Interesting and Helpful Committee Report to the New York State Conference of Mayors and Other City Officials

THE parking of automobiles is seriously interfering with the operation of street-cleaning departments in many American cities. In those cities which clean streets in congested districts during daylight hours when parking is general, cleaning by machine brooms, squeegees and pick-up sweepers is almost impossible, and those departments which use flushers and hand patrol exclusively find their work retarded at all times of the day. Many cities, therefore, have abandoned daylight cleaning in congested districts, except to patrol streets with white wings, and have resorted to night cleaning. This, under ordinary conditions, is regarded as less satisfactory and more expensive than day cleaning, but changed traffic conditions and parking have made it necessary.

As parking is not so prevalent in residential districts, its effect on street cleaning has not been so serious. There are, however, several cities which have taken drastic steps to eliminate interference by parked cars with street cleaning in both congested and residential districts. While the moving automobile has made street cleaning easier by forcing most of the litter to the gutter, the standing automobile has made the work more difficult, as it occupies that part of the pavement which is now in the greatest need of cleaning.

Reports received from 118 American cities by the New York State Bureau of Municipal Information reveal that thirteen cities now have in effect ordinances prohibiting the parking of automobiles on a given street during a given time, so that street cleaning work may

be done thoroughly and without interruption. In all of these cities this ordinance is enforced by the police department. Three cities report that their police do not enforce the regulations to such a point as to clear the streets of all parked cars for the purpose of cleaning the pavement. In such instances the street-cleaning forces either move the cars and clean the gutters with gutter sweepers or reach under the cars with hand brooms as far as possible.

How does your city efficiently clean gutters, where most of the street dirt is, if the street is not clear of parked vehicles? In answer to this question, seventy cities report that they clean at night or in the early morning when pavements are practically clear of vehicles. Some cities clean all pavements on which cars are parked, with white wings, who sweep under the vehicles. Many cities, in their congested districts, use flushers or pick-up sweepers during the night or early morning and hand patrol during the day. In a few cities where parking is prohibited during certain hours of the day, the street-cleaning departments do the best they can in these streets during the "no parking" periods. Some departments clean outlying sections first, starting at midnight, and work in business sections from 4 A. M. to 8 A. M.

In many cities, gutters are cleaned only by white wings with hand brooms. Parked cars which interfere with the cleaning are moved by the police or street-cleaning forces in a few cities. Des Moines, Iowa, says that the foreman of street cleaning is authorized as a

police officer to shift cars or temporarily barricade parts of streets needing cleaning. Flint, Mich., reports that its greatest difficulty is encountered in the vicinity of large industries where cars are parked day and night. Jackson, Mich., comments on a somewhat similar experience. It says: "The only place where we have trouble in cleaning gutters is in front of some of the factories where cars are parked during the day. As these are scattered over a wide area, it makes cleaning at night expensive. Some factories are cooperating with us by having their men clean these places at night, the dirt being left in piles where we can get at it." Ogden, Utah, provides that all cars must be parked two feet from the gutter.

Several suggestions have been received from superintendents in American cities for the solution of the street-cleaning problems for which the parked automobile is responsible. Thirty-one cities suggest the enactment of ordinances which will prohibit the parking of automobiles at night. Twenty others advocate cleaning during those hours at night when there is a minimum number of parked cars. A few think that the flushing of streets will solve the problems. One suggests that parking be prohibited on certain streets between certain hours on certain days, and that streets to be cleaned be placarded.

Various suggestions have been received as to the parking regulations a city should adopt to promote economical and thorough cleaning. Some favor a prohibition on parking during certain hours, others after midnight, during cleaning hours in congested districts, on certain streets, or on all paved streets. The consensus of opinion is that parking should be prohibited between hours when there is the least amount of parking and for a period sufficiently long to enable the city to clean its streets.

Recommendations

No recommendations can be made by any committee which will solve the street-cleaning problems resulting from parked cars in all cities or in all sections of any particular city. As the Superintendent of Philadelphia says: "The problem of cleaning streets on which cars are parked differs necessarily in each district and also in portions of the same district." Nevertheless, some recommendations can be made which, if adopted, we believe, will help to reduce or to check the increase in the cost of street cleaning and will aid street-cleaning

departments in doing better work.

To prohibit absolutely the parking of cars during those hours of the day or night when streets are to be cleaned is the only action a city can take to solve permanently all the problems encountered by street-cleaning forces as a result of parking automobiles in public highways. We believe that this is the goal toward which all cities will have to proceed. Between this drastic action and no regulations at all there are several steps which a city can take in its effort to reach the permanent solution of its problems. Night or early morning cleaning of congested districts with motor cleaning apparatus and hand patrol during the day, with no restrictions on parking so far as it will aid cleaning forces, is the first step. Time limits on parking during those hours of the night when parking is negligible is another step. An absolute parking prohibition for all paved streets, unless car is attended by driver, during certain hours of the day or night, is the final step.

In drafting an ordinance to regulate parking so that streets may be cleaned thoroughly and without interruption, the following points must be carefully considered:

1. Whether or not the ordinance shall apply to all paved streets or to those in the congested district or to certain designated streets.
2. Whether or not parking should be allowed for a certain limited time.
3. What sections of the city shall be cleaned during certain hours.
4. Whether cleaning shall be done during the day or at night.
5. What streets shall be cleaned by flushing, by motor sweeping and by hand patrol.
6. The hours between which no parking or limited parking shall be allowed, so as to cause the least inconvenience to the public.

For those cities which contemplate regulating parking for the benefit of street-cleaning forces, we suggest the following skeleton ordinance:

"It shall be unlawful for any person to park or leave unattended for any time [longer than] any vehicle upon any paved street in [name district, or designate streets] between the hours of and"

This report was presented April 24, 1924, by John A. Giles, Mayor, Binghamton, N. Y.; Chairman; William H. Lyon, Commissioner of Public Works, White Plains, N. Y.; William F. Schwartz, Councilman, Buffalo, N. Y.; Lester W. Herzog, Commissioner of Public Works, Albany, N. Y.

The Street Lights of a Town of 2,500

Adequate Illumination at Moderate Cost Is Possible in Small Municipality
as in Large City

BEXLEY, a suburb of Columbus, Ohio, among whose approximately 2,500 inhabitants are many business men of Columbus, recently decided that it needed a modern street-lighting system—needed it not only for the sake of convenience and appearance, but as a protection against burglary. All it had for illuminating its thoroughfares was multiple lamps attached to telephone poles at hazardous street crossings. There was nothing even approaching a coordinated, efficient, present-day lighting plan.

It now has a lighting system that meets all requirements. With 320 new lighting units of the latest pattern, systematically arranged, it has not merely an up-to-date and thoroughly efficient equipment, but one of the very largest residential street-lighting systems per capita of any community in the country—practically one to each eight inhabitants.

When it was decided to institute this improvement, a lighting committee was appointed by the Council to make an investigation as to what lighting equipment should be obtained. The result was that G-E Novalux lighting units, Form 8, with flash rippled globe and canopy, dome refractor, and equipped with 4000-lumen (400-candle-power) Mazda lamps, were chosen. These are mounted on Union Metal Company standards especially designed for this installation.

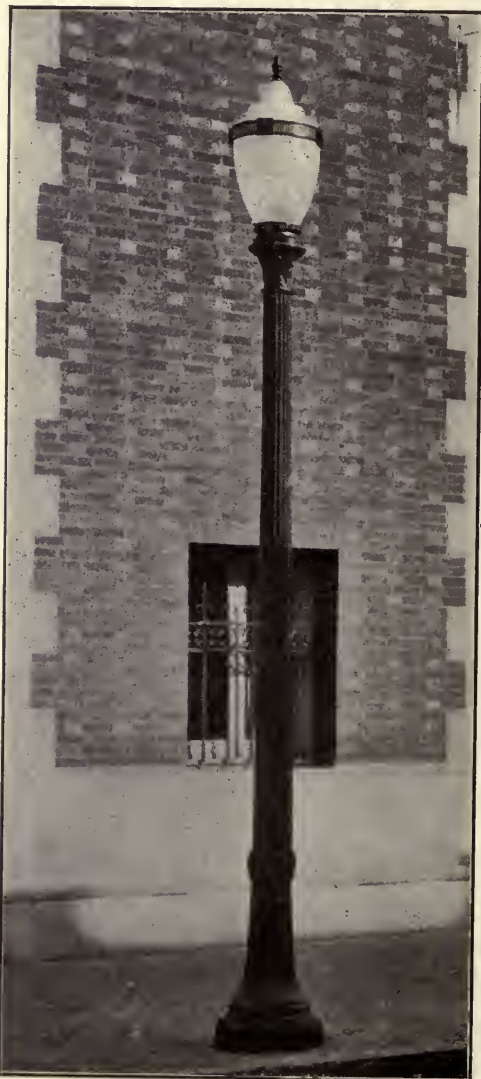
The total number of units and standards is 320. They are 12½ feet high from the sidewalk to the light source, and are placed at varying intervals in accordance with traffic and other conditions. The spacing along the St. Louis-Washington highway is 100 feet; in the built-up residential streets, 200 feet; and along Broad Street, a thoroughfare leading to and from the city, over which a large amount of traffic passes but which is not closely built up, 150 feet. The standards are staggered in all cases.

In the base of each standard is a transformer for 400- and 600-candle-power lamps, which increases the factor of safety and permits the use of high-power lamps. The system is divided into six circuits, each controlled by a transformer.

The installation involves the use of 155,600 feet of No. 8 single-conductor, rubber-insulated, lead-covered and armored parkway

cable for a 3,500-volt circuit. The units are operated all night, being on a 4,000-hour schedule. The cost of the system was approximately \$75,000.

A noteworthy feature of the installation is that the units have been so arranged as to illuminate not only the fronts, but the sides and rear of buildings, so far as practicable. Whenever the illumination of a garage or the rear of a house could be effected by slightly



TYPICAL STREET LIGHTING STANDARD IN
BEXLEY, OHIO

changing the spacing of the lighting standards, such change was made.

P. W. Frye is chairman of the street-lighting committee, and has been assisted by R. J.

Wheaton, O. F. Manley and R. L. Phelps. The engineering work has been in charge of the Jennings & Lawrence Company, engineers for the village.

Water-Main Cleaning in New Albany, Indiana

Distinct Advantages Shown in Saving Cost of Extensive Additions

By J. O. Endris

Superintendent, Water Department, Interstate Public Service Company, New Albany, Ind.

NEW ALBANY, Ind., is a city situated on the Ohio River, just below the falls and, on account of its location, has a considerable river frontage. It is bounded on the west by hills, on the south by the Ohio River, and on the east and north by open rolling country. The city itself is rather flat. Because of being located on the river, the city in its growth has extended in an eastward direction, making it long and narrow.

In 1875, when the original water plant was erected, advantage was taken of the hills in the western section of the city, which provided a gravity system of water-supply. The pumping-station is located near the banks of the Ohio River, from which the supply is taken. The water is pumped from this point to a series of natural sedimentation basins on the hill west of the city, a suburb called Silver Hills.

Our company some few years ago installed a modern filtration plant adjacent to the sedimentation basins, which have a daily reserve capacity of approximately 26,000,000 gallons. After the water is pumped into the open basins, it flows through the filtration plant by gravity into the clear well, then by gravity through a series of distribution mains to the city supply. The natural pressure obtained is from 70 to 80 pounds. One of the greatest problems that confronted our company was the fact that a large percentage of the daily demand is required in the eastern section of the city, which is admirably adapted to manufacturing. As this section is in the opposite end of the city from our plant, considerable loss in pressure and volume was experienced through friction in transmission.

means of purification was aeration in the reservoirs and as much natural sedimentation as could be obtained. As the city grew and the demand for water increased, this method became less and less efficient, until at certain periods of high turbidity in the Ohio River, water with considerable sediment was delivered into the distribution system. This, along with the natural incrustation which takes place through long usage of water through pipes, increased the friction losses and decreased the delivery to such a point that in cases of unusual demand in various sections of the city, and especially in case of fire, the supply became inadequate.

This necessitated making some investigations as to whether the demand had increased to such a point that great expenditures would have to be made in additional main feeder lines, or whether it had been brought about to a great extent by the corrosion that had developed in the lines in the 48 years they had been in service.

In explaining these conditions, I do not wish to leave the impression that the distribution system in the city of New Albany, laid out in 1875, had all the necessary provisions made to take care of the 1923 or 1924 delivery. We did find out, however, through tests and experiments, that the older portion of the distribution system was very badly corroded and that some increased efficiency could be obtained by a series of main-cleaning operations. This work was begun on a large scale in 1922, but only in the smaller distribution mains in the outlying districts of the city, where the effects of low pressure were so noticeable.

Increased Pipe Friction Makes Consideration of New Feeders Necessary

In 1875, when the plant was first installed, filtration was not thought of and the only

One-Source Sprinkler Systems Complicate Situation

Owing to the rather high general pressure carried throughout the gravity distribution

system of the city. a number of manufacturers have found it greatly to their advantage to provide themselves with automatic sprinkler systems. A good many were able to obtain decidedly lower insurance rates with a one-source supply sprinkler system, depending upon the water company to supply this, which was accepted by the insurance companies and the State Inspection bureau.

In some cases this placed us in a rather embarrassing position, since all manufacturers desiring sprinkler systems connected to our supply felt that they should enjoy the same privilege as others who had obtained approved single-source connections from us, and insisted that they be furnished the same service in their locality and thereby be prevented from having to spend considerable sums of money on the installation and maintenance of a secondary supply. Of course, we did not feel obligated in all cases to fulfill the manufacturer's wish, as some concerns located their plants in such isolated districts that the distribution mains were unable to take care of the excessive demand. However, the policy of our company has always been to be as fair as possible, commensurate with the returns obtained therefrom.

I want to mention one particular case where this year's cleaning operation materially benefited one of our large factory consumers.

The Pickrel Veneer Company was anxious to install a sprinkler system, but wanted it on the one-source supply. The Inspection Bureau came to New Albany, made its tests and reported that our supply was insufficient. The company at that time was very doubtful regarding the results to be obtained from main-cleaning, and I persuaded them to let me try the idea in this particular section. To-day we have a 6-inch sprinkling connection with the Pickrel Veneer Company's plants and one that has been accepted by the Inspection Bureau and the Insurance Company entirely on account of the results obtained by main-cleaning work.

While the static pressure was not materially changed, the volume delivered was increased by about 40 per cent, and yet when we proposed to this particular manufacturer that we use this method in furnishing him with adequate service, he would not accept it, and stated further that he did not like to see us waste our money in this manner; but we have to-day in our files a letter from him commending us upon the results we obtained and the benefit we were able to give his plant.

The results we obtained in the program for

1922 were so satisfactory that we increased the program for 1923 and undertook what we considered a very hazardous job, in order to increase the service to our consumer.

Cleaning the Main Distributing Arteries

I have previously mentioned the fact that the main distributing arteries from the reservoirs on Silver Hills were a portion of the original plant and these were badly in need of being brought back to their original capacity. One of these mains, 16 inches in diameter, is the nucleus of the eastern supply of the city, and taking it out of service would not only cut the pressure more than half, but, what was more serious, it would reduce the volume by approximately 60 per cent.

There being three lines, two 12-inch and one 16-inch, to be cleaned, we chose the smaller ones first, in order to increase their efficiency as much as possible, before trying the 16-inch leading to the factory district. In pipes of this size, where the pressure is sufficient, the cleaning machine is pushed through by the water, and, as long as there is no obstruction, such as valves partly closed, valve stems hanging, lead from a poorly poured joint, or a sharp right-angle bend, one may feel sure that the machine will bring the pipe within 98 per cent of its original capacity in a very few minutes.

These two 12-inch lines pass under two creeks and through a tunnel approximately 300 feet long, where, we realized, it would be a very serious matter if the cleaner became obstructed. We were fortunate, however, to get the cleaner through this portion of the line, but when we reached the city and were working under the first block of brick pavement, we encountered our first obstruction.

Incidentally, following up a cleaner that is being pushed through by the pressure of the water is very interesting. Under ordinary circumstances, it can readily be followed with an aquaphone placed against the ground just above the point where the pipe line is located. In some cases, however, this method fails and it is necessary to determine the location by opening fire-hydrants or various valves along the line to ascertain by the flow of water the approximate location of the cleaner.

At the first obstruction it was necessary for us to tear up the street and break the pipe, where we found the cleaner had become caught on lead from a joint that had been poorly yarned before pouring. In fact, when we got the lead out and weighed it, it was equal to a full pig, or 100 pounds. After this, how-

ever, it took but a short time to finish the 12-inch sections, as we encountered no more serious trouble.

The first section of 12-inch main cleaned in one shot was 2,200 feet; the second was 2,700 feet, and the third was 465 feet, which completed the work of the 12-inch lines into the distribution system of the city. The next task was to undertake the cleaning of the 16-inch line from the reservoirs to Vincennes and Elm Streets in the eastern section of the city, a distance of a little over two miles.

In this length there were two right-angle turns. Not knowing whether these turns had been made with 90-degree bends or two 45's, it was necessary for us to determine this so as not to run any chances; in fact, it was necessary to eliminate all the possibilities of danger that could be anticipated, in order that this line could be taken out of service and replaced within the shortest possible time.

We had hoped to begin the first thing in the morning and have the line back in service by noontime. Before we began, however, every manufacturing concern affected, and, in fact, every large water consumer, was notified by a personal letter, telling them of our intentions and what we hoped to accomplish by the work, and suggesting that while this work was in progress particular attention be given to the subject of fires. A good many of the manufacturers helped us to the extent of stationing men at their plants during this period, whose duty would be to locate fires in their incipency, if such should occur. We also asked the help of the Fire Department in realizing fully the deficiency that would occur in the water-supply and in using chemicals wherever possible.

It was ascertained that the valves leading to and from this line were in good operating condition. We were then prepared to insert the cleaner in the outlet from the basin on Silver Hills, ready for its journey through the city.

The next morning the work began, and the first trouble encountered was the breaking of one of the stems in the valves of the 16-inch main at the base of the hill. This delayed the work about half a day, during which time the pressure in the city had been greatly decreased. With the help of one of the pumping engines of the Fire Department in taking the water from the ditch while repairs were being made, we overcame this trouble.

We were again ready in the afternoon to make the shot, and to our surprise and satisfaction the cleaner traveled the entire distance of over 2 miles in about 40 minutes and brought with it tons of refuse from the pipe. In fact, aside from that which was washed into the sewer in the surrounding locality, two 5-ton truck-loads of reddish-brown substance resembling iron oxide were removed from the street. The pipe was examined as soon as the water was pumped out, to determine the efficiency of the cleaning, and was found to be practically in its original condition; even the tar coating on the pipe was perfect.

All replacements were immediately made, and the same evening about five o'clock the valves on the line were opened and observations made on the various test gages that had been placed through the city. It was gratifying to find that the static pressure in all sections affected by this line was increased from 9 to 10 pounds, and with various flow tests made within the next few days an increase in delivery of from 30 to 45 per cent was found. This completed the major portion of the work. In addition, we cleaned one half-mile of 10-inch and several miles of 6- and 8-inch with equally good results.

The efficiency of the system has been so increased that, outside of some cross-connecting mains which are being installed from year to year, we have been able to postpone indefinitely a great expenditure on new distribution lines. Another contract has just been signed with the main-cleaning company for our 1924 cleaning program, in which it is expected to clean from 6 to 8 miles more of the mains.

We use our own organization for this work, with the exception of a superintendent, who is furnished by the main-cleaning company along with the equipment. The average cost to us, including all sizes, has been approximately 22 cents per foot.

In conclusion, our experience has shown that main-cleaning not only increases the efficiency of the mains, but is also an excellent way of detecting leakage, defective valves, closed or partially closed valves, sizes of lines and where they begin and end, and various intersecting conditions on which our records on the older distribution system were vague.

ACKNOWLEDGMENT.—From a paper read before the Indiana Sanitary and Water Supply Association.

Filtration of a municipal water-supply without chlorination is not playing safe. Chlorinate, and lock the door against disease.

Garbage Reduction in Palo Alto, Calif.

ACCORDING to the Fourteenth Annual Report of the Board of Public Works of Palo Alto, the amount of garbage and refuse collected and burned at the city destructor plant during 1923 was 2,668.42 tons. This was 129.54 tons less than was destroyed during 1921-22. The operation of the incinerator plant and collection service for the last five years shows the following comparative data:

Year	Total Earnings	Total Cost
1917-18.....	\$7,422.06	\$8,799.62
1918-19.....	9,123.54	10,059.86
1919-20.....	12,611.50	12,887.77
1920-21.....	13,270.40	13,621.96
1921-22.....	14,096.16	13,551.43
1922-23.....	16,340.93	17,704.24

	Refuse Destroyed (Tons)	Residual Clinker and Ash (Tons)
Profit* or Loss		
*\$1,377.56	1,796.33	446.84
*936.32	1,917.67	584.06
*276.27	1,793.78	639.45
*351.56	2,120.09	657.10
544.73	2,797.96	666.94
*1,363.31	2,668.42	769.69

The incinerator plant was installed in 1912. It is known as a high-temperature type and contains two cells, a combustion chamber and the necessary forced draft apparatus. It is now operating at about two-thirds capacity. The rate of growth of the city at present is such that it will be necessary to enlarge the plant possibly in from three to four years.

The following table shows the unit cost and gives a statistical description of the destructor:

Unit Cost of Refuse Disposal	1921-22	1922-23
Weight of refuse destroyed (tons)		
Palo Alto	2,675.91	2,350.95
Stanford University	122.05	317.47
Labor cost operating destructor plant per ton of refuse.....	\$0.95	\$1.13
Power cost	0.03	0.07
Supplies and fuel.....	0.11	0.22
Repairs	0.07	0.38
Bond interest and depreciation on plant	0.49	0.49
Total plant cost	1.65	2.30
Collecting cost (city).....	2.88	4.40
Office and accounting expense (city)	0.46	0.51
Total collection and accounting costs	3.34	4.92
Remarks:		
Number of furnace grates in incinerator	2	...
Total grate area (square feet) ..	33	...
Weight of refuse burned (tons) ..	2,668.42	...
Weight of residual clinker, ash, etc. (tons)	769.69	...
Percentage of residue.....	29.0	...
Average amount of refuse burned per hour (tons).....	0.75	...
Rates of refuse collection:		
Two times per month.....	\$0.50	per month
Once per week.....	0.75	per month
Twice per week.....	1.00	per month
Three times per week.....	1.50	per month
Six times per week.....	3.00	per month

The maximum amount of waste that collectors are required to move at each call is the contents of the garbage can and ½-cubic yard of rubbish, such as ashes, tree trimmings, garden refuse, etc. The rubbish and other material may be deposited in a large box, of not over ½-cubic-yard capacity, placed near the garbage can.

A New Method of Resurfacing a Gravel Road

Rhythmic Condition of Road in New Mexico Removed by Novel Method

A ROUGH, corrugated section of highway in Federal Aid Project No. 48, located between Chaves and Dexter, Chaves County, N. Mex., has been turned into a smooth roadway as a result of an experiment by the State Highway Department, W. C. Davidson, Engineer in Charge of District No. 2. The caliche surfacing on this project had become deficient in binder because of dry weather and high winds which followed immediately after the completion of the road. A "chuggy" condition resulted which resisted ordinary maintenance methods. It was decided finally to scarify a section of the road and reshape and roll the crown.

The road was closed to traffic for a distance of approximately one mile, and a heavy scarifier on a Russell grader drawn by a 10-ton Holt tractor was then used, penetrating the surfacing course to a depth of 3 or 4 inches and covering the entire

crown of the road-bed. The road was then harrowed with a farm harrow to bring the large-sized gravel to the top. This large gravel was removed and pushed into a deep trench that had been plowed on the shoulder, which was then covered completely, burying the large gravel.

The crown of the road was brought to section with a Havelock highway maintainer and a float drag. Some roadside material for binding was brought from the shoulders. The road was then rolled until no further compaction was obtained, resulting in a smooth, even surface.

A distance of exactly 0.8 mile was scarified in this way at a cost of \$125, which would be at the rate of \$156.25 per mile. This cost, however, could be reduced somewhat if the work was extended over a greater mileage, and by organizing so that the finishing crew would closely follow the scarifier.

Municipal Control of Land Subdivisions in New Jersey

AT its last session the New Jersey Legislature adopted (as Chapter 73 of the Laws of 1924) an act which makes it unlawful in any sale of land to give to the purchaser "any conveyance or instrument wherein any reference is made to any map, plat, plan or chart of lands

showing new streets, avenues, roads, lanes or alleys which has not been approved by a resolution passed by the council, board of aldermen, township committee or other governing body having control of streets and highways of the municipality."



YOUNG AMERICANS OF SEVENTEEN NATIONALITIES AT THE PUBLIC LIBRARY, GARY, IND.

How About Your Community Library?

By Joseph Ernest McAfee

MR. CARNEGIE gave several millions of dollars to help American communities supply themselves with public libraries. Each, on receiving his grant, assumed certain obligations for permanent maintenance. Scores of these communities have defaulted.

Nobody seems disposed to sue the defaulters for breach of contract, but the record stands against them. The library is often not measuring up to its mission. A library building, however decorative, is of itself no great boon to a town. Hundreds of communities, however, are content with these more or less pleasing pieces of architecture, apparently having little conception of what a library is for.

The greatest waste to-day in the average American community is that of ideas. City plans are, in some cities, organizing future development; community chests are systematizing the collection of charitable funds, and are doing something toward economizing their expenditure; commission and city manager programs of government are reducing formerly chaotic public budgets and public service to a semblance of order and economy.

But for the most part ideas lie dormant or run wild.

Doubtless the library is not the last word in the organization of a community's ideas, but it is to-day one of the most hopeful objects on the social landscape. It can furnish at least the nucleus of the people's university which must develop and expand in every community if democracy is to function efficiently.

Vigor Needed in Library Leadership

For one thing, we should have a new type of librarian, and, above all, the community should take him for what he ought to be. Many of the present librarians are of the right kind, but their communities do not know it. They do not know what a librarian is for, and hence they do not use him for what he has in him to be and do.

An overwhelming proportion of the librarians are not "him"; they are "her." A woman librarian is perfectly all right, as woman. The very fact that so many of the librarians are now women does womankind honor as having qualities of, and aspirations



CHOOSING THEIR FAVORITE BOOKS AT THE GREENVILLE, S. C., PUBLIC LIBRARY

to, culture. But the community needs vigorous leadership in the fulfillment of the library's mission. Many a woman would exercise that leadership if the community would let her. But if a truant community will let only a man figuratively take it by the collar and do for it in adult education what it needs to have done for it, then a man is needed as librarian. For there is no question but that vigor is needed in library leadership.

In one town of the West a woman librarian took hold and in eight years' time had her town on the culture map of her state in fast colors. The youngsters were trained to be readers. They stuck to school. The town had the largest enrollment in the high-school grades of any community in all the region, though there were many cities of larger population. The whole town is "different"; every visitor notices it. And she was so largely credited with the difference that her state appropriated her, made her Secretary of the State Library Commission, and set her to spreading the same methods and ideals throughout a population of over two millions, where there are less than a hundred and fifty libraries, all told, and half of the counties have no library at all.

Ingenuity in Library Service

In an eastern town another woman librarian has a reputation far and wide for amazing

ingenuity in serving her public. No local or national event of first-rate importance occurs without an immediate display in the library of the literature—newspaper, magazine, and book—bearing upon it and related subjects. There are special tables and alcoves and bulletin boards where they catch the eye of every visitor. Nothing dry-as-dust about that institution. Those who frequent the place know that they are living in the world of to-day; they also find out where it hooks on to the world of yesterday, and where it is likely to hook up to-morrow.

One day a citizen brought into his community library a handful of choice flowers. They were on display at the front entrance in a twinkling, labeled with both their common and their botanical name. The next issue of the local paper announced that throughout the season a special display of the community's flowers would be found at the library. The librarian took the community on faith. It did not fail her. The flowers were brought in, common flowers, rare flowers, beautiful weeds and costly orchids. The display of flowers in the library became one



BANK EXHIBIT IN HACKLEY PUBLIC LIBRARY, MUSKEGON, MICH.

Held for ten days and repeated one week each in several other local banks. No fiction included, except half a table of attractive editions of "Books you always meant to read." All books were selected for subject appeal and front-cover effect

of the functions of the community. It helped materially in giving that town its present enviable reputation for lovely home gardens and imposing annual flower-shows.

There is no limit to the variety of things an ingenious librarian can do for his or her community. But little delicate bits of service are not the consummation of the library's mission. A new day is upon us, and a new and far-reaching organization of ideas is needed in every community.

The library schools see it, and are seeking to turn out a more robust type of public servant. The new librarian boasts not of how many books he has on his shelves, but of how many he has off his shelves and in the homes of the people. One community of eleven thousand has between five and six thousand library cards out. An average of two hundred or more persons resort to the library every day.

Nor can the modern library be content merely to pass out books over its counter and take them back in due course. Some day the community library will have a card catalog, not alone of the books it owns, but of the entire citizenship. A librarian—doubtless we shall have another and more accurate name for this functionary—will study people quite as much as, or more than, he will books. He will know books mainly to know how well they will serve the individual or the group in his community. His card catalog will note the intellectual needs and bent of each citizen, and it will be as definitely his responsibility to serve those needs and help to cultivate that bent as it is the business of the school superintendent and his corps of workers to care for the culture and training in citizenship of the young.

The Menace of the Closed Adult Mind

The pressing problem of education to-day is less that of the young mind, and more that of the adult. The youngster will learn. He was born that way and has not lived long enough to get over it. The menace to democratic society and its institutions is the closed adult mind. A twofold obligation should be held before every citizen: learn something new about your vocation and gain more skill in it every day; and perfect yourself in some definite avocation through which you can serve the larger interests of your community. Be a worker and be a social servant; and be a good citizen in both and all. To live and take part in a progressive democratic society, each citizen must be a student year in and year out, in youth and in age. We should dis-



THIS OUTDOOR BULLETIN BOARD AT THE CARY MEMORIAL LIBRARY, LEXINGTON, MASS., LURES MANY PEOPLE INTO THE LIBRARY

abuse our minds of the notion that education is a process of worming youngster through certain standardized schoolroom disciplines, after which they will draw a sigh of relief that it is over and they can now see about something serious and interesting. Rightly conceived, education is a joyous process which begins with the cradle and end only with the grave.

We do not need nor will tolerate any dragging of sovereign citizens into slavish intellectual castes. We must encourage, not suppress, freedom of thought. But our tremendous resources of free thought must be harnessed to the glorious tasks of community building and good citizenship. A good start will be in the community library. It is already the most democratic agency for culture which we have.

Get a man of big caliber, of vision, of boundless intellectual resources, of keen social insight, of appreciation of the true aims and methods of intelligent citizenship, and make him your librarian. Or find a woman of the same caliber and mold. Then take him or her for what he or she actually is. Send the whole community to school to itself. It will not require mountains of public expenditure nor an army of teachers and truant officers. Happily we cannot browbeat adults into learning, as we unfortunately often try to do with the youngsters.

A capable head of a worthy community



J. B. Benedict, Architect

HIGHLAND PARK BRANCH LIBRARY, DENVER, COLO.

library may become the community's most useful citizen, the inspirer of its highest idealism, the mobilizer of its moral and intellectual resources, the organizer of its ideas. The

community library stands as a great implement, not yet adequately used, for achieving the destinies of a thoroughgoing and intelligent democracy.

Trenton Requires That Service Stations Maintain Comfort Stations

THE following ordinance was adopted by the Commissioners of Trenton, April 4, and approved by Mayor Donnelly the next day:

AN ORDINANCE CONCERNING MOTOR VEHICLE SERVICE STATIONS

The Board of Commissioners of the City of Trenton do ordain:

1. The words "in-and-out motor vehicle service station," as used hereinafter, mean a station supplying oil and gas that may be approached only by leaving the highway.

2. That from and after the passage of this ordinance no permit shall be issued by the Department of Building Inspection for the construction, enlargement or substantial alteration of any in-and-out motor vehicle service station unless the plans therefor provide suitable toilet conveniences for the accommodation of the general public; such conveniences shall include at least one toilet, urinal and washstand for men and one toilet and washstand for women. Such conveniences shall be located on the premises so as to afford easy access thereto, and the building or portion thereof in which they are placed shall be so planned as to provide proper light, heat, good ventilation and

sanitation, and proper privacy, and shall at all times be equipped with such toilet fixtures and accessories as are needful for the use of such accommodation. All such conveniences shall be kept in a good sanitary condition and be open to the general public during the business hours of such motor vehicle service station.

3. A standard bearing the inscription "Public Comfort Station," and an arrow giving direction, shall be furnished by the city and placed at the curb on the street near the entrance to such station. If two or more entrances are maintained to any such station, such standard shall be placed and maintained near each of them.

4. Any person who shall construct, enlarge or alter any such motor vehicle service station, or maintain any conveniences or fail to maintain any conveniences, including the building or part thereof, required for the public accommodation by the provisions of this ordinance, in violation of any such provisions, shall forfeit and pay a penalty not to exceed the sum of \$100 for each offense, and each day such violation shall be continued shall be deemed and taken to be a separate and distinct offense.

Every Community of 5,000 or More Can Afford a Swimming Pool

By C. R. Wood

Superintendent of Recreation, Lynchburg, Va.

THOSE city governments that have a lively interest in the general welfare of their citizens, both young and old, have been quick to realize the great need for and the general good derived from, properly supervised municipal swimming. The larger cities with greater resources have been able

course, the desirable site, in that the expense of the required excavation is thus reduced to a minimum. Elaborate plans are costly, and embellishment for the sake of appearances need have no part in swimming pools for communities of modest means.

Contrary to the prevailing impression,



MILLER PARK MUNICIPAL POOL, LYNCHBURG, VA.

to build costly natatoriums on a large scale, involving huge sums of money, but smaller towns have been slow to follow their example because of a mistaken idea as to prohibitive cost of construction.

An out-of-door pool is within reach of every community of 5,000 or more if care and good judgment are used in the selection of the site and the kind and cost of construction. In many instances there are bodies of water within the confines of a city, or sufficiently near-by, which could be inexpensively converted into satisfactory and safe public bathing-places; for example, an abandoned reservoir, a small lake or pond.

When an entirely new development is necessary, some natural depression is, of

municipal swimming pools are not a modern institution, but their origin can be traced back more than 2,000 years. In the year 154 B. C., the Emperor at Rome dedicated an abandoned reservoir in the Caelian Hill to the people for bathing purposes. Five hundred years later, in the same city, there were 952 small bathing-pools and 12 large ones, these last called *thermae*. The Titus the smallest of the 12, was 390 by 341 feet while the largest, named the Diocletian measured 1,333 by 1,300 feet and had facilities to accommodate 3,000 people at one time. The pools were open to all, and a quadrans (about one cent) was the charge of admission. Lepers and others with visible signs of disease were excluded. The pools were sup



OLD-FASHIONED GARDEN, MILLER PARK, BEAUTIFIED BY OVERFLOW WATER FROM THE SWIMMING POOL

plied with fresh running water from the giant aqueducts carrying the city's water-supply.

In the past, public swimming pools have been held by some to be a potential source of wide-spread infection of certain water-borne diseases, namely, typhoid fever and various skin diseases. The method of operation of many pools gave, no doubt, ample ground for this fear. But following an extensive study of this subject by certain authoritative agencies, such as the U. S. Public Health Service, the American Red Cross, the Playground and Recreation Association of America, and others that have widely disseminated the results of their findings, there is now readily available expert information concerning easily applied methods whereby pools can be maintained at all times in a sanitary condition.* Therefore, at this time there is no reason why even the smallest community cannot operate a municipal pool without the danger which no doubt existed a few years ago.

How Lynchburg Did It

The experience of the city of Lynchburg along this line may be of some interest to cities that feel the need but fear the price. A 250,000-gallon-capacity outdoor pool and a 4-room 60- by 20-foot bath-house, with facilities to accommodate a maximum daily attendance of 500, has been built at the low cost of \$2,225.36. In 1921 the City Manager abolished the "Zoo" at Miller Park.

* For an authoritative discussion of this subject, see article on "The Design of Swimming Pools as to Operation and Sanitation," by Jack J. Hinman, Jr., Associate Professor of Sanitation, University of Iowa; pp. 353-359, *THE AMERICAN CITY*, April, 1924.

This was deemed advisable for three reasons: first, the small collection of wild animals were of little educational value to the people of the city; second, there was a pronounced absence of interest in these exhibits; and third, the cost of up-keep and additions to this small menagerie would furnish ample funds for purposes of more general good to all members of the community. In keeping with the thought of the greatest good to the largest number for the money expended, recreational facilities were provided instead of animal exhibits; trees were sacrificed for an athletic field; houses which had been used for animal and tree exhibits were remodeled for community purposes; but the most radical

change was that relating to two ponds for water-fowls which were selected as a swimming pool site.

At a cost of \$565.77, and with the aid of city prison labor, these two connecting duck-ponds were enlarged and deepened, providing a swimming pool in the shape of a figure 8, which was 125 feet long with an average width of 55 feet. To reduce the construction of walls to a minimum, the sides of the pool, where they were below the surface of the adjoining ground, were formed by excavation to a slope of about 45 degrees. These slopes, together with the bottom, were covered by a slab of concrete, 6 inches thick, the sides being reinforced with wire fencing. Thus, it was necessary to construct a wall from the top of the concrete slope to the elevation established for the height of the pool only in those places where the topography was such that the slope itself did not reach this elevation. These walls were very limited in height, and accordingly but little thickness was required. Building stone and brick salvaged from other work being available, these materials were laid into walls which otherwise would have been built of concrete.

This construction is not in conformity with what is generally understood to be good engineering practice; in fact, some engineers were not hesitant in expressing their disapproval of a design of this character. However, the City Manager, who is a member of the American Society of Civil Engineers, approved the design as being reasonably safe. In his opinion, the large amount of money saved by following this plan, instead of the so-called standard designs, fully justified its

adoption, even though some changes might be necessary at a later date. As a matter of fact, the pool has been in use three years and has answered every requirement, and not one cent has been spent for repairs due to faulty design.

A 40- by 20-foot bath-house, with locker facilities for 130, was built, and a 4-foot concrete walk was laid around the pool at a cost of \$1,882.36. An addition to the bath-house has been necessary each season to accommodate the increasing patronage. The addition of 1922 provided 171 lockers at a cost of \$403.46, and the 1923 annex cost \$373.11 and furnished 100 more lockers. The bath-house, which is now 60 by 20 feet, has four dressing rooms with showers, 401 lockers, a hallway and an office. The sides and roof of this frame building are covered with shingles. The pool is supplied with city water, which flows continuously through a 3-inch pipe.

The Miller Park Pool is probably one of the few self-sustaining municipally owned pools in the country. While it is not the policy of the city authorities to procure revenue in this manner, it is believed that a small admission fee not only adds to the appreciation of the bathers but limits the attendance within bounds of safety. Although this fee is but 5 cents for children and 10 cents for adults, the receipts for the year totaled \$2,061.25. The total expense during this period was \$1,122.44, which includes salaries of life-guards, attendants and a matron, also all general operation and maintenance. Had the water been paid for at the general rate paid by all consumers, the cost of water would

have been \$879.66. As a matter of fact, the water consumed was not wholly occasioned by the pool, because the duck-ponds had been supplied in previous years. Again, the water as it flows from the spillway of the pool forms a small stream which is used to beautify that section of the park known as the Old-fashioned Garden, containing many lily ponds, miniature lakes and rustic bridges.

The success of any project is determined by the results obtained; therefore, in this instance, the steadily increasing attendance is most indicative. The total attendance for the 1923 season was 25,974, an increase of 7,123 over 1922, and an increase of 15,736 over 1921. The maximum daily attendance for the past season was 643. On account of the efficient work of the life-guards, the more than 25,000 bathers were handled last summer without a casualty.

As the pool is fed by a continuous flow of water from the city mains, the pool had the lowest bacteria count of the several swimming places in the city. Regular weekly tests by the City Bureau of Health were made, and the sanitation of the pool was at all times supervised by this department.

The city of Lynchburg is developing a 47-acre tract into an additional park at Riverside. Recreational facilities will have special consideration in this park. Plans are complete for an outdoor pool 200 by 60 feet, and the same general method of construction will be followed as that of the Miller Park Pool. The city believes that a swimming pool for its citizens is a better investment than a pond for ducks.

Board of Health Urges Proper Care of Milk After Delivery

THE enormous increase of bacteria in market milk when not kept under proper conditions after delivery to the consumer is graphically shown in a recent bulletin of the Indiana State Board of Health.

A quart bottle of fresh market milk of good quality was secured and a bacterial count of it made at once. The milk was then divided into three equal portions and each portion placed in a sterilized bottle and covered with a sterile cap. One portion was placed in an ordinary ice box such as is usually found in the housewife's kitchen. Another was placed on the window ledge outside the room. And the third was kept on a table in the room at an average temperature of about seventy degrees Fahrenheit.

After twenty-four hours, bacterial counts of each portion were made. The figures above the bottles indicate the relative number of bacteria in each bottle of milk. It is seen that the bacterial life at the end of the twenty-four hours had increased but little in the milk kept in the ice box. It had multiplied more than ten times in the one on the window ledge, and in the one kept at room

temperature it had multiplied to such an extent that it was impossible to count the bacteria present.

The results show clearly that milk, immediately upon delivery, should be placed in the ice box or in some other place in which it will be kept very cool.



County Road Cost-Keeping

By Alan K. Hay

Engineer, Ottawa Suburban Roads Commission, Ontario

MOST county organizations find it difficult to install a good system of cost-accounting on road work, owing to the lack of sufficient office assistance and to the scattered location and seasonal nature of the work done.

Very elaborate cost-accounting methods are used by large industrial corporations where most of the work is highly standardized and the same operations are performed day after day. These conditions do not usually obtain on highway work, and the county engineer or superintendent must govern himself, not by what he would like to have in the matter of tabulated unit costs, but by the facilities he may have for obtaining these costs, by how much of his own time and effort he is prepared to spend on the work, and by the amount of cooperation he may expect to get from his staff and his foremen. On these things will rest the success of his system. It is useless to introduce an elaborate set of printed forms to be kept entered at frequent intervals, unless it is known that means are at hand to keep them posted up to date.

It is not usually possible to delegate all of the work of cost-keeping to the bookkeeper. The bookkeeper deals in abstract figures, which must be accurate to the cent; and while it is desirable that cost figures check the books to a reasonable degree, the same degree of accuracy is not necessary and a lot of time may often be saved by approximations. The office bookkeeper may carry out the mechanical work of entering cost figures on ledgers or distribution sheets, but the actual distribution of costs of work under different headings should be supervised by some one who is in constant touch with the outside work, and usually this person will be the engineer or superintendent or his assistant, if he is fortunate enough to have one. These limitations will determine how much cost data it is possible to obtain with the expenditure of a reasonable amount of time and effort. It is better to have cost figures on the main divisions of the work, and to have such figures kept up to date and readily available, rather than to branch into too many details and a top-heavy system which is kept up intermittently.

The Necessary Figures

Where facilities are limited, there are certain main unit costs which are common to road work in all counties, and which should always be available. These are as follows:

1. Haulage costs per ton-mile or per yard-mile
2. Cost per ton of quarrying and crushing rock, and the cost per cubic yard of gravel loaded at pit
3. Cost per ton or per cubic yard of stone or gravel consolidated in place in the roadway
4. Cost per square yard of the higher types of road surface or pavements, and the cost per square yard of surface-treating the lower types with oil or tar
5. Cost per cubic yard of concrete in structures

These are some of the fundamental items on any system of road construction or maintenance. It is also desirable to get information as to costs of subdivisions of the above, as, for example, the cost of the various items entering into rock crushing—stripping, fuel, dynamite, etc.; but in any case, the cost of the principal items should be available.

Day-Labor Costs

As a rule, the work on which figures are most often required is day-labor work. To get the unit labor cost a good set of time-book and pay-list forms is essential. These should be as simple as possible in order that foremen or other employees may fill them out intelligently. This point is the one on which many systems have fallen down, as it is usual to find a number of the foremen who are otherwise valuable employees, who are at sea when required to put their ideas on paper. To meet this condition it is necessary that the forms filled out by the foremen be the simplest obtainable.

I have found it convenient to use a time-book in which each workman has a whole page to himself, covering a fortnight's work, on which there is space to write down in the lines provided for each day, details as to what work the man was engaged in. The average foreman will find it simpler to use than the usual type of time-book with ruled columns and small squares for the figures.

This time-book is sent to the office each fortnight, and from it the pay-list is made

[illegible]

SAMPLE FORMS USED BY OTTAWA SUBURBAN ROADS COMMISSION FOR COUNTY ROAD
COST-KEEPING

1. Forms for pay list in the form of a loose-leaf ledger, measuring $12\frac{3}{4}$ x 14 inches, printed on both sides. On the reverse is the distribution of the account between construction and maintenance. 2. Inspector's report of culvert construction. The same as 5, except printed in blue with no data on the back. 3. Requirement forms in duplicate, measuring 4 x 6 inches. Original on white paper, duplicate on white card. 4. Purchase order, measuring $8\frac{1}{4}$ x 7 inches, issued in duplicate, the duplicate being on yellow paper. 5. Inspector's report on road construction, measuring $3\frac{3}{4}$ x $6\frac{1}{4}$ inches. This form is punched for a 6-ring loose-leaf book. The reverse contains information regarding the extent to which the foundation, surface and shoulders are complete, a place for the report of the stone received for the first course, second course and shoulders by team loads and truck loads, divided into 2-inch and 1-inch stone and screenings. There is also a place for a statement of the number of road rollers at work, coal and other materials received. 6. and 6a. These forms, measuring $6\frac{1}{2}$ x 5 inches, are in a bound book printed on white paper, the illustration showing the front and reverse of the sheet from the time book. 7. A 4 x 6 stock inventory card printed the same on both sides on a white card. 8. Inspector's report on quarrying and crushing, measuring $3\frac{3}{4}$ x $6\frac{1}{4}$ inches, with a place on the back for the report of the size of stone, output, number of feet drilled and the materials received, including the fuel and explosives. This form is in yellow, while Form 5 on road construction is pink.

out and also a distribution charge placed on the back of the pay-list, showing the amount chargeable to different roads, whether construction or maintenance, and the location and class of work performed.

If the foreman makes out his own pay-sheet, as is done in many counties, the procedure will be different. If the foreman is competent to figure out the distribution and enter it on the pay-sheet, by all means have him do so, but in many cases it will be advisable to have him send a time-book to the office with his pay-sheet and from this time-book figure out the proper charges at headquarters.

Where a large piece of day-labor construction is being carried out in one place, it is possible to employ a time-keeper who can do most of the cost-accounting work for that job, but this condition of affairs is seldom met with in county work, as the operations are too small and too widely scattered to warrant engaging time-keepers.

Material Costs

Material costs are usually handled in the office. When an invoice comes in and it is known where the material is to be used, mark up the charge on the invoice on a charge sheet. When material is purchased to be used over a number of jobs, I make a temporary entry in a special account and make the final charge later when the information comes to hand as to where the material was finally used.

There should be a system of requisition forms used so that some employee can be held responsible for every movement of material or equipment. By this means the proper charging may be determined, responsibility is fixed, and invoices may be properly checked when received. An inventory of all tools and supplies should be kept (preferably on a card system) which should show the exact quantities on hand at any given time. This forms a useful guide for future purchasing.

One or more central storage yards with provision for housing and repairing machinery and tools will do a lot to eliminate waste and increase efficiency. Far too much municipal machinery is allowed to rust in the open during the winter months and does not receive its annual overhauling until the construction season is under way, with resulting loss of time and injury to the work. A good workman is judged by the way he keeps his tools, and the same holds true for corporations.

The use of central storage yards or plants will give a much-needed check on all mate-

rial used, and by having each employee sign a requisition for every item used by him, a lot of leaks may be stopped. When a man signs his name as being responsible for certain tools or equipment, he will be a lot more careful in looking after it and seeing that it is duly returned and checked off at the end of the job.

Materials and tools purchased at a distance from county headquarters may be included in the system by requiring the foreman purchasing them to forward a requisition and receipt for them which should check the dealer's invoice. As a rule, such purchases may be confined to small items only, as it is advisable to do the bulk of the purchasing at headquarters, where close prices may be had on quantity orders. The material may then be issued in small lots as required for the various jobs, after passing it through the storage yard or stockroom.

Contract Work

A large amount of construction is carried out by contract, and the procedure for obtaining unit costs will be somewhat different. Of course the cost to the county will be the unit price which the contractor tenders for each portion of his contract, but it is often desirable to know what his unit labor costs are on various subdivisions of the work.

For this purpose the inspector should be furnished with a daily report form which he fills out, and if he is reasonably capable he may be entrusted with the work of figuring out the contractor's labor costs. Material costs on contract work are usually difficult to obtain, unless the contractor maintains his office on the work. Contractors do not always take kindly to the idea of somebody's keeping tab on their costs, but it should be possible to convince them that the resulting figures are of as much value to them as to the engineer.

A word as to the use of cost data. The engineer or superintendent desires costs so that he can check one project against another, so that he can compare one season's work with another season's work, and as a basis for future estimates. For this last purpose, his own figures are infinitely more useful than someone else's. Other people's cost figures are of little value unless accompanied by minute details of wage and material rates and information as to local conditions prevailing on the work. Local conditions vary so much in different counties, and even in different parts of the same county, that a first-hand knowledge of the situation is necessary before comparisons may be made.

Summary

To sum up—try to devise a system which suits your own special requirements, and have your cost information up to date, reliable and readily accessible, as to the main features of your work. If you haven't the time or facili-

ties, do not attempt too much detail, but what material you do obtain put in such form that it will be available for your use at a moment's notice.

ACKNOWLEDGMENT.—From a paper read before the Annual Road Conference of the Ontario Highways Department.

How Do We See by Street Lights?

VISION is accomplished in two ways or in a combination of two ways. Objects, persons, etc., are seen either in silhouette against the lighted background of the street surface or else by the direct light from the lamps themselves. When objects are seen in silhouette, their bulk or outline is observed, and when objects are seen in perspective or by direct light, their details or features are distinguished. All objects, therefore, whether by day or by night, must be seen either in silhouette or in perspective or in a combination of the two. These principles should be remembered, as street lighting to a very large degree depends upon them, no matter what class of street lighting is being considered. Vision by silhouette has been known and recognized by artists for many years, but has been appreciated by the illuminating engineer for only a comparatively short time.

Depending upon these two methods of vision are the two main types of street lighting, which may be classified as

1. Large-unit lighting
2. Small-unit lighting

If a large unit equipped with a diffusing globe, for example either a 6.6-ampere luminous arc lamp or a 1,500-lumen incandescent Mazda C light, be placed at the side of the street about 300 feet away, objects and persons will be seen more in silhouette than in perspective. This is commonly termed "large-unit street lighting," and the illumination may be of maximum high intensity and from a concentrated light source. It is clear, therefore, that whenever large-unit lighting is employed, silhouetting will be more generally used, particularly so when the lighting units are spaced quite a distance apart. The closer the unit is spaced, the more will perspective vision occur, in conjunction, of course, with silhouette vision. The diffusing globe will cut

down the candle-power of either of the large units to about 960. If, for instance, twelve 80-candle-power incandescent lights are grouped together and placed in a single large globe, the resultant illumination will be practically the same as with the use of the single large unit.

Suppose, however, that these twelve small 80-candle-power incandescent lights were distributed along the same street and uniformly spaced. The result would be known as "small-unit street lighting." The illumination would be fairly uniform and of low intensity and from distributed light sources. With this type of street lighting, there would not be enough intensity for either silhouette or good perspective vision.

There is still a very important phase that should be considered, namely, the status of large units versus small units viewed from an economical standpoint. A city or town, naturally, since it is the party that has to pay the bill, is most vitally interested in street lighting and its cost. Since many cities have a certain appropriation for street lighting, they usually want to know what kind of lighting will give the best results for that amount of money, rather than what is the best street lighting they can get and then how much it will cost. According to prevailing conditions and rates, it will cost the city approximately \$100 per year for each large unit and about \$25 per year for each small unit, considering the sizes mentioned above. This will mean something like three large units for every twelve small units, or, roughly, three times the total light flux with its accompanying increased illumination and better visual effect for the same total cost per year.

From a paper on "The Why and How of Street Lighting," by Stephen Carleton Rogers, read before the American Society for Municipal Improvements, at Atlanta, Ga.

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Quote as you wish, giving credit to THE AMERICAN CITY.

For Wiser, Not Smaller, Municipal Expenditures

To the Editor of THE AMERICAN CITY:

"Municipal extravagance" has been the subject of diatribes by publicists and by Federal officers who very humanly do not see the beam in their own eye while beseeching that the mote be cast out of the eye of others. A typical example is an article published about a year ago by an able journalist, who took isolated instances without apparent knowledge of local needs or conditions and wrote an indictment of the expenditures of our local governments that was both amusing and impressive, until analysis of a few of the specific cases made clear that the wisdom of these expenditures was at the worst an open question and was very far from justifying the charge of wild-eyed extravagance.

Inexcusable inaccuracies are cited to prove that states, cities and counties have gone wild in borrowing money for public purposes. A statistician of excellent repute makes the astonishing statement that during the past five years state, county and city bonds have been issued for roads, schoolhouses, public buildings, and a host of other things, to an amount about as great as all the government, Liberty, etc., bonds issued during the World War. As a matter of fact, the best estimate of state and local borrowings for the past five years shows the total to be \$5,281,781,268, or between one-quarter and one-fifth the amount of Federal bonds issued during the war. Such articles and misstatements, coupled with references to municipal extravagance by President Coolidge and Secretary Mellon, are building up a public belief that local

governments are enjoying a wild orgy of spending—especially as regards capital expenditures—because none of the discussion or agitation referred to is apparently aimed at operating expense.

Consideration of expenditures from these tax-exempt securities develops some interesting facts. In the first place, \$275,000,000, or about 20 per cent of the bonds issued in the past five years, paid state bonuses to soldiers — an extravagance, perhaps, but certainly not "highways, schools, public buildings" and hosts of other things. Probably at least half of the remainder went for highways, good road and pavements—which public needs demand and which the Federal Government encourages even to the extent of giving Federal aid,—a direct invitation to extravagance far more potent than a lower

The Hue and Cry Against "Municipal Extravagance"

This letter is one of many comments evoked from students of municipal affairs by the recent hue and cry against "municipal extravagance." The writer, formerly City Engineer of Dayton, and City Manager of Jackson and Grand Rapids, Mich., has recently been serving as a civic consultant for several New England cities. In sending the letter Mr. Cummin writes:

"Our cities are not headed for the financial bow-wows. There is increased rather than decreased care and wisdom apparent. Tax exemption or no tax exemption for municipal bonds should be argued on its merits as a tax problem and not in its supposed relation to municipal 'extravagance.'"

interest rate on bonds.

Are municipalities extravagant in their capital expenditures? Unquestionably they make mistakes. Undoubtedly they make unwise expenditures, but so have private corporations under the ægis of our most prominent financiers. It is doubtful whether any municipality has ever made as disastrous an investment as that of the New York, New Haven and Hartford Railroad in the electric lines of New England. In the main it is my opinion, based on a careful study of the operations of some forty cities east of the Rockies, that they have lost more money by *not* making needed capital expenditures than they have by making "extravagant" capital expenditures. They have used inefficient and out-of-date equipment or gone without needed equip-

ment rather than borrow the money for purchasing what was needed, although the savings would pay the cost in from one to three years. They have painfully maintained, or tried to maintain, water-bound macadam streets rather than borrow the money to put in modern street surfaces, although the saving in maintenance alone would pay principal and interest on the bonds twice over. In one case the expenditure of \$100,000 for replacing cobble gutters would save an annual gutter cleaning charge that would pay both interest and principal on \$480,000 of bonds. We used to build badly lighted, unsanitary fire-traps for schoolhouses. Does any one seriously contend that a change to a well-lighted, sanitary, fire-proof schoolhouse is an extravagance?

Another phase of the discussion that needs emphasis is the widely held theory that public borrowings are spent for non-productive purposes—"funds badly needed for productive purposes are diverted into unproductive and frequently wasteful public expenditures." Your January editorial very properly points out some of the unproductive purposes for which money is used in private industry, such as cosmetics, jewelry, etc. It is possible, however, to compare the most productive use of industrial expenditures with public expenditures without the latter's suffering any injury thereby. Perhaps the primary need of modern civilization is transportation. Quite probably Secretary Mellon has in mind the railroads as the greatest sufferers in the diversion of funds to which he refers. Is the money spent by the city of New York for its subways any less productive (in a transportation sense) than private investments for similar purposes? Is Cincinnati's use of public funds for building the Cincinnati Southern Railway any less productive than the use of private funds for railway purposes? These are unusual instances, it is true, but wise expenditures for highways, education, sanitation, etc., by cities are just as productive as even the highest-type private expenditures.

Many persons, who should know better, attempt to make a fundamental distinction between a city and a business by declaring that "a city is primarily a spending institution, a business an earning one." Nothing is more untrue or vicious in its effects upon encouraging extravagance and ill-considered

public expenditures. To argue that expenditures for the protection of lives and property, the conservation of the public health, the education of our children, and the many conveniences and comforts furnished by our cities, do not earn anything is the merest claptrap. The fact that the city treasurer does not send a dividend check to the taxpayer does not mean that no dividends are earned or paid. The dividends are paid in needed service rendered, although necessary parks, paved streets, sewers, etc., actually add more than their cost to the value of the property which they benefit and thus pay material dividends.

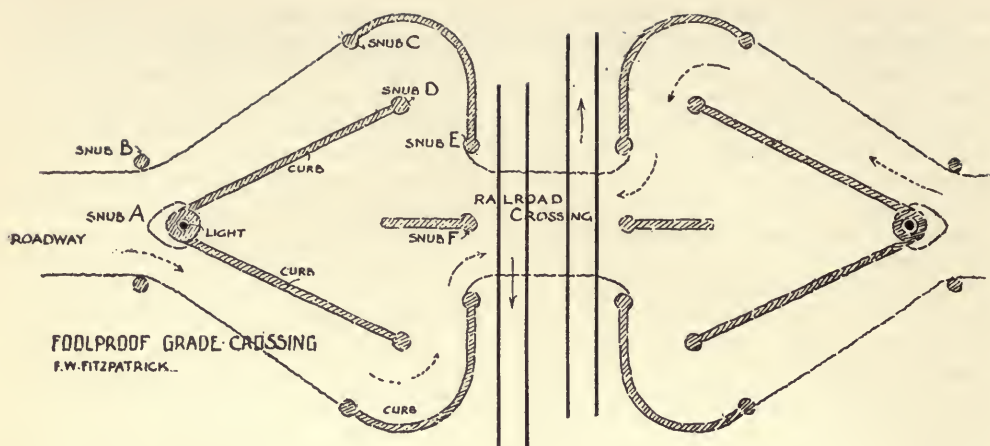
Sometimes it is possible to prove directly that an increase in taxes may pay actual dividends to the taxpayer. In a city recently studied it was found that previously garbage had been collected by individual family contract with a scavenger at an average cost of \$6 per family per year. The city took over the service and performed it equally as well at an average cost of \$1.05 per family per year. The taxes had to be increased to cover the service, but there was an actual saving of \$4.95 per family to the taxpayer. Instances of this kind could be multiplied. Unwise expenditures are encouraged by arguing that there is no use of weighing results against cost in public expenditure. A city renders service and facilities to its citizens. If the services or facilities will bring results, tangible or intangible, in excess of their respective costs, and are within the means of the community, they are desirable expenditures in an actual economic sense. The advisability of a public expenditure should bear exactly the same analysis as does a private expenditure—will the result justify the expenditure?

Cities should carefully judge of the wisdom of proposed expenditures; their bonds should be issued only in accordance with sound financial principles, adequate and proper provision being made for redemption at maturity. Cities do not always act this way, but when they do there is no reason for getting excited about the mere size of their expenditures. What they get for the expenditure is the real test.

GAYLORD C. CUMMIN.

Concord, Mass., April 12, 1924.

[EDITORIAL NOTE.—For another interesting analysis of the problems discussed by Mr. Cummin, see "Civic Psychology and Municipal Taxation," by Arland D. Weeks, in THE AMERICAN CITY for February, 1924, page 142.]



A Fool-proof Grade Crossing

By F. W. Fitzpatrick

Consulting Architect, Chicago

FIVE people a day killed upon railroad grade crossings, and probably twice as many more or less seriously hurt, is our record. One to be proud of, almost as noble a record as our gun-murders! The bereaved families suffer and complain, but the rest of us are not overly perturbed. We accept it as we accept so much else that is utterly unnecessary—supinely, as the inevitable, the accustomed, perhaps even the will of a benign Providence. But perhaps we should call most of these crossing fatalities stupid or deliberate suicides, rather than murders. True, the railways should not have grade crossings, so they are to blame to an extent; but people, particularly in automobiles, are so foolhardy, though theirs is the chief peril, that most of the blame seems to be theirs.

Intelligent officials, both of municipalities and of railroads, are working toward elevated or sunken crossings. The toll in human life is too great to be longer tolerated, but the work of remedying the evil is slow and costly and I fear we shall have the grade crossing still with us for many a day. As long as we must have grade crossings, we should make them as little dangerous as we can. Safety gates, ringing bells, flashing lights, watchmen, all depend more or less upon human agencies for operation, or upon mechanical devices that may fail, and, therefore, all are fallible. What we should have is something that actually *makes* every one stop, look

and listen and go across tracks slowly and carefully—a fool-proof crossing.

The suggestion I offer is old in principle but new in application. I saw a rough diagram of substantially this mode of arranging crossings some time ago, but do not know the name of the deviser. Whoever he is, he deserves great praise, for it is the most sensible thing that has yet been offered. I mean sensible in being within what is termed reasonable reach, since viaducts, elevated tracks and such are deemed unattainable in many places.

The principle was applied years ago. Washington's beautiful Rock Creek Park was being laid out. We felt the need of police, more of them than the city could spare, to keep the owners of fast horses (it was years before the automobile) from speeding and racing over the fine roads that were being planned. A bright young engineer officer suggested that these roads have so many sharp turns that a driver would be kept busy turning them and no chance for speed, for a false move meant a spill in the creek or jamming one's horse into a mass of rocks. And to-day those twisting roads are equally effective in curbing the enthusiasm of automobilists, for there are fewer accidents there than almost anywhere else in the land.

This fool-proof grade crossing is the same idea—just a widening of the road into a big Y and forcing the driver to twist around a sort of letter S before get-

ting on the tracks. He can't speed; he has to slow down or smash. Snub A forces him to the right into the narrow arm of the Y just wide enough for one machine. He then faces up the track and can see whether a train is coming that way. Stout snubbing posts and their connecting curbs guide his course. When he gets to snub F, he has no speed, and he has seen up and down the track, has had his hands full of twisting around rather sharp curves and is in the chastened mood in which one should be to cross a railroad discreetly. He has had time and opportunity to look and listen and almost stop, and if he still persists in crossing in the face of a nearing train, then indeed is he bent upon suicide and nothing will stop him.

Snub A is big enough to withstand any shock. If one jams into it, he is out of commission right then and at least will not get messed-up on the tracks. The curves are so calculated that the largest truck made can negotiate them, or a machine with a trailer; the curbs are low enough not to be in the way of long material—telegraph poles, for instance, being hauled by truck.

No expensive or difficult or long-drawn-out construction is needed—just good blobs of concrete for snubs and a 12-inch curb to define the curves. Snub F is to keep a road-hog from making a wide turn onto the tracks and getting in the way of a machine coming from the other direction. No watchmen or gates are needed, just an automobile stopper that is permanent, effective and of negligible cost.

From the tables of experiences with humans who persist in doing fool things after being properly warned, but who may be forcibly prevented from doing them thoughtlessly, we can safely bank on such fool-proof crossings, if universally adopted, cutting down the toll of death to one a day, instead of five. Is it worth while, or is it true, as is so often claimed, that we Americans hold human life as cheap as do the head-hunters of central Africa?

In our record of awful mortality by murder and preventable accidents, we are at the head of all the civilized world. Perhaps that is a distinction, but the fact remains that the aforesaid wildest and bloodiest of savages are our closest competitors when it comes to valuing human life.

Atlanta's Inter-Civic Council

THERE is at present functioning in Atlanta, Ga., a unique body known as the Inter-Civic Council, whose membership is composed of the President and two immediate past Presidents of the local Rotary, Kiwanis, Lions and Civitan Clubs, and the President and Secretary and immediate past President of the Atlanta Chamber of Commerce. This Council was first organized in October, 1921, its membership at that time being limited to representatives of the four luncheon clubs. After functioning for one year on this basis, the membership of the Council unanimously decided to broaden the scope of their work by affiliation with the Chamber of Commerce, and upon an invitation from the Council, three representatives of the Chamber were appointed to membership.

The principal objects of the Inter-Civic Council are to strengthen the spirit of cooperation between the five membership organizations; to eliminate any possible friction and duplication of effort, and to discuss ways and means of promoting the general welfare of Atlanta. The Council in no way interferes with the individuality of the various organizations and is not

in any sense a legislative body. It functions solely as a council, as the name implies. Regular monthly meetings of this representative group of public-spirited business men are held, and to these gatherings may be traced the origination of some of the most constructive pieces of work accomplished in the city during the last few years. Matters under consideration can only be adopted by the consent of a majority of the representatives of each member organization, and before any action can be taken, the members must submit the matters to their respective Boards of Directors for approval and endorsement.

Each year, during the Christmas season, a special meeting of the Council is held in one of the local theaters, to which the general public is invited. A regular program is arranged, on which each member organization is represented by some special feature or a speaker. Capacity audiences have attended each of these annual functions held so far, and through these meetings the public has been made acquainted with the altruistic ideas of the organizations represented in the Council, and with the actual work which is being accomplished.

THE NEW IDEA IN EDUCATION

The whole philosophy of the schools has been transformed. It has become socialized. Now we say, "If you get an education it will enable you to understand other people, to get the other person's point of view; it makes you compassionate; you will be more helpful; you can serve better and work better with others in this service."—Payson Smith.

Resurfacing Brick Pavements in Bluefield, West Virginia

By Robert L. Horne

Assistant City Engineer

ONE of the first investigations made by the Engineering Department under Bluefield's new form of city manager government consisted of a survey of all the brick pavements on the main streets in the city, with a view to rehabilitating. These pavements, which were of vitrified brick with grout filler, had been laid over a period of years dating from 1905, on an inadequate concrete base and a sand cushion varying from 1 to 2 inches in thickness. Heavier pavement loads and increased travel made a telling effect on the brick surface. No effort or provision was made for proper maintenance, and the public utilities continued digging up the pavement. On Princeton Avenue the car-track was in bad condition because of faulty track construction. These items made economic maintenance an impossibility and reconstruction imperative.

The resurfacing was started on Princeton Avenue during the latter part of September, 1923, when the contractor began the construction of curb and gutter against the rough stone wall which formed the north edge of the old pavement. This was done to enable the roller to compact the edge of the pavement, also to allow the new motor sweeper to get a good, clean job, which had been impossible before this curb and gutter was constructed. Except where radii were enlarged, this was the only portion of the work on which combined curb and gutter was used.

The present pavement was not disturbed except where a bad depression existed and along the old curb where a row of brick was removed for the construction of a 6-inch concrete gutter, which was built so that a shoulder of approximately 3 inches remained above the brick. This necessarily cut down the curb exposure to about 4 inches, and where this could not be obtained the gutter was lowered and a strip of brick removed sufficient to obtain the 3-inch top and still carry a crown to the center of the pavement. At every intersection the radii were enlarged as much as possible, 12 feet being the minimum radius used.

Concrete surface and base were used in track construction by the street railway com-



CONCRETE CURB AND GUTTER CONSTRUCTED AGAINST ROUGH STONE WALL ON NORTH EDGE OF OLD PAVEMENT, PRINCETON AVENUE, BLUEFIELD, W. VA.

pany. It was necessary to replace about one-half of the base, at which time the tracks were raised to correspond to the new pavement elevation. Where the base was found to be of sufficient depth, a 3-inch creosoted wood block was spiked solidly to the ties under each rail. The company then Thermit-welded all joints, and at certain intervals tie rods were welded to the rails. Carey Elastite expansion joints were used in the top course, which was not less than 7 inches thick. These joints were placed on either side of each rail, and every 30 feet between the rails. The top course was carried 1 foot outside of the rails and finished in one operation with a specially designed roller, mounted on wheels, which was pulled along the track. All traffic was discontinued while pouring concrete and during the two-weeks curing period. The company transferred its passengers in a large automobile bus during the entire construction.



PRINCETON AVENUE AND FEDERAL STREET, BLUEFIELD, W. VA., AFTER 2-FOOT RADII OF CURB HAD BEEN INCREASED TO 15 FEET

Upon the completion of this preliminary work, the asphalt gang began laying the $1\frac{1}{2}$ -inch binder course and $1\frac{1}{2}$ -inch sheet asphalt wearing surface. Extra binder in depressions and at street intersections made the pavement look exceptionally thick, but the failure to crown the original pavement at the intersections fully explained the matter. After the first rain had disappeared without leaving the customary puddles, the public was satisfied. In addition to Princeton Avenue, Federal Street and Raleigh Street were also resurfaced. Neither of these streets had car-tracks, and they averaged 34 feet between curbs. On Raleigh Street an 8-inch brick gutter, laid with old brick, was constructed in lieu of the 6-inch concrete gutter.

Approximately two and one-half months were required to lay the asphalt on this job, including lay-offs due to plant breakdown and

inclement weather. A total of 15,620 square yards of 3-inch top and 1,947 tons of extra binder in depressions was laid during this time. The pavement width on Princeton Avenue varied from 20 to 30 feet, not including the car-tracks. The average cost per square yard of finished pavement was \$4.28, and the cost per front foot varied from \$5.13 to \$7.89. These costs include all engineering and inspection, but not the cost of changing storm sewer lines and appurtenances. These expenses were defrayed by the city.

Bland Street and Bluefield Avenue are included in this year's paving program but will not be resurfaced because the pavements will be badly torn up by the utility companies in replacing worn-out equipment. In addition, Bland Street is being widened 8 feet and the car-track placed in the middle of the pavement.

The Interrelationships of Hospital and Community

PRELIMINARY announcement of a prize essay competition on the vitally important subject, "The Interrelationships of Hospital and Community," is made by The Modern Hospital Publishing Co., Inc., in the June issues of *The Modern Hospital* and *The Nation's Health*. Three cash prizes of \$350, \$150 and \$100 will be awarded, and there will be such honorable mentions as may be authorized by the Committee of

Awards. The purpose of this competition is to concentrate the thought of hospital, public health, medical and social welfare workers on this timely subject for the purpose of crystallizing opinions and defining future objectives. The general program for the competition may be obtained upon application to The Modern Hospital Publishing Co., Inc., 22 East Ontario Street, Chicago, Ill.

Chamber of Commerce Activities in Public Affairs

Teaching the A. B. C. of Safety

ZANESVILLE, OHIO.—At the instigation of the Chamber of Commerce, and upon proclamation by Mayor C. C. Slater, the city of Zanesville recently conducted a unique and successful Safety Week campaign. During that week not a single accident in the community was recorded. This municipal safety effort was the direct outgrowth of a movement by the local branch of the American Rolling Mill Company to imbue its 900 employees with the habit of caution. At this plant a goal of "No Accidents" for an entire month was set and reached — a noteworthy achievement in view of the fact that the average number of accidents occurring at the plant had previously been ten per month. At the end of the second week of the company's drive, the date for the community-wide effort was set by the Mayor.

The preliminary arrangements for Safety Week were undertaken by the Chamber of Commerce, in cooperation with the city administration, and their efforts, together with some excellent assistance from the personnel of the American Rolling Mill Company, accomplished some splendid results in the short space of time available. One unusual feature of the program was the stenciling of the letters A. B. C. on all of the principal street corners of the city, the work being done with the aid of the Boy Scouts. In order to arouse the curiosity of the public, no mention was at first made of the message which these letters were intended to convey. Their meaning was later made clear through the local newspapers, and in this way the slogan of "Always Be Careful" was driven home. As a timely warning to reckless drivers, a badly wrecked automobile, decorated with appropriate signs, was exhibited on the Court House esplanade. Store windows carried safety cards and posters, and Boy Scouts paraded the streets bearing banners of warning against "jay-walking" and other common causes of accidents. Speakers on accident prevention were provided for the public schools, and city officials and representatives from the State Fire Marshal's office visited the school buildings and unexpectedly sounded the fire-alarms to test the regulation of the system. The newspapers did

their share in the work by running first-page articles daily on the Safety Week program and its progress.

On the whole, the results of this educational effort in accident prevention were so satisfactory that a permanent community safety organization for this city will probably be formed.

KARL S. DIXON,
Manager, Chamber of Commerce.

Revaluation of Taxable Property

NEWBURYPORT, MASS.—Two and one-half years ago, at the time of the reorganization of the Newburyport Chamber of Commerce, one of the outstanding needs of the city was a revaluation of taxable property, in order to give to the city the income from taxation it should have and to iron out inequalities then existing on the assessors' books.

Apparently the main task of the Board of Assessors in the past had been to copy, from year to year, values that had once been placed on property in an unscientific manner. The meager salary which had previously been paid the Assessors would warrant nothing different. One of the first things the Chamber of Commerce did was to advocate a reorganization of the Board of Assessors and

the payment of salaries that would warrant good work.

To cooperate in the revaluation, the Chamber of Commerce appointed a committee from its membership of men familiar with local real estate values, consisting of one commercial banker, a member from the board of investment of each of the two savings banks, and three local real estate men. Instead of asking the committee to go ahead with a study and survey of local valuations and then report to the Board of Directors of the Chamber, and in turn have them make recommendations to the city government, we offered the services of our committee, through the Mayor, to the Board of Assessors. That body immediately took advantage of the offer, and for the past two years the Board of Assessors and the Chamber committee have been studying and revaluing property in our city. The relations between the two have been most cordial.

"Building Green Bay"

It is admitted by all that the future of Green Bay rests not in the mere brick and stone and mortar of the buildings which give physical prominence to this city—but rather in the Spirit and Vision of our people.

Faith in Green Bay is necessary as is the Vision to do one's part in building for the Citizens of Tomorrow. The real meaning of Vision is well illustrated by an incident which happened during the building of one of the famous old Cathedrals of Southern France.

Noticing three men doing more or less the same work, the old Abbe asked the first man his task and received the answer "I'm hauling stone."

To the same question the second replied, "I'm cutting stone for three francs a day."

Turning to the third man the old Abbe said "My good man, what is your job here?"

And the third man looking up at the Abbe in surprise, pointed to the building under construction and said "My job? Why, my job is building that Cathedral."

There may be those in Green Bay who are merely "hauling stone", there may be some who are only "working for what is in the pay envelope"—but the duty of all is to have the Vision so that by their deeds and spirit they may proudly say—

"I'm Building Green Bay"

THE FINE STORY OF THE THREE CATHEDRAL BUILDERS IS BEING USED IN THIS EFFECTIVE WAY BY THE CHAMBER OF COMMERCE OF GREEN BAY, WIS.

To attempt to give the details of operation would, in the space allotted, be impractical. Suffice it to say that we have as yet finished the revaluation of land only, and have added \$1,221,174 to the assessed valuation of the city. At our present tax rate of \$3.50 per \$100, this means an added income yearly to the city of better than \$42,000. When the buildings of the city have been revalued, it is reasonable to believe that these figures will be materially increased.

That the public is satisfied with the work is evidenced by a minimum number of complaints entered at the assessors' office relative to revaluation, and by the fact that not one case has been carried to court.

We should be pleased to go into detail with any communities interested in similar work.

FLOYD R. SEEKINS,

Managing Secretary, Newburyport Chamber of Commerce.

Better Homes from Old Houses

FLINT, MICH.—The Flint Chamber of Commerce believes that it can combine good business



FRONT AND RIGHT SIDES OF OLD HOUSE

and good civics by cooperating with the movement now gaining rapid headway throughout the United States for the modernizing of old houses. This movement is of special interest to home owners and to such local groups in any city as architects, building contractors, carpenters, dealers in hardware, lumber and building supplies, and real estate men.

A 16-page book entitled "Better Homes from Old Houses," prepared by the staff of the Architectural Forum for the Barrett Company, New York, will be of real value to every chamber of commerce desiring to promote this campaign locally. The booklet contains plans and an outline of methods for remodeling out-of-date, uncomfortable old houses into beautiful, modern homes. Every one interested in the housing problem is aware of the contrast offered by the unattractive, ill-designed houses erected by the thousand between 1870 and 1910. The men and women of 1924 have no sympathy for the "good taste" of 1874. No one wants to live in an out-of-date "mansion" of the latter period. Yet these ugly old houses are almost always solidly constructed, representing honest workmanship from cellar to garret. To pull them down and rebuild from the ground up would mean an enormous eco-

nomic waste, a total loss to the country of the millions of dollars of investment that they represent.

Here is where "Better Homes from Old Houses" steps in.

For each of six different types of old house, there are shown five separate plans for alteration, ranging in cost from \$200 to \$8,000. The resulting changes in appearance and interior arrangements may be seen in little drawings and floor plans. There is also an interesting chapter, entitled "What to Do and How to Do It," telling how to get bids on the projected work from your local builder, how to raise money from bankers and Building and Loan Associations, and many other bits of invaluable information. There is also a discussion of the importance of the roof in remodeling houses, showing the rich color effects that can be achieved with modern types of mineral-surfaced shingles.

C. W. OTTO,

Manager, Chamber of Commerce.

Pasadena's Golden Jubilee Celebration

PASADENA, CALIF.—Pasadena, now a city of 60,000 population, was "settled" in the year 1874. The fiftieth anniversary of this event is being commemorated by a series of "events" running through the whole year of 1924, thus making a rather unique civic enterprise. The program includes conventions, festivals, pageants, exhibits, entertainments, athletic contests and many other meetings which exemplify the ideals for which the city stands in science, education, religion, homes, business, art, patriotism, welfare, good government, good fellowship, horticulture and rec-



THE HOUSE REMODELED WITH SIDE PORCH AND LONG DORMER

reation—the twelve outstanding characteristics of our city.

We shall be glad to send to any reader of THE AMERICAN CITY a folder containing a list of the principal events scheduled in this all-year birthday party, and also a separate program of the special activities in Pasadena's recent "Music Week" celebration.

WILLIAM DUNKERLEY,

Secretary, Pasadena Chamber of Commerce and Civic Association.

Public Comfort Station Operated

CLINTON, IOWA.—On April 15 a free comfort station was opened which will be maintained entirely by the Clinton Chamber of Commerce. It consists of a commodious lounging-room, a cozy rest room for women, and wash-rooms for women and men.

Clinton has a population of about 26,000 and a trade territory of about 65,000. Moreover, being at the intersection of the Lincoln Highway and the Mississippi Scenic Highway, the city is visited by thousands of tourists every year. Not only will the conveniences afforded by the comfort station be greatly appreciated both by shoppers and tourists, but a number of merchants have been alert to the possibilities for business near the station, and all the store rooms were rented before the building was completed.

Everything considered, we believe this to be one of the best moves we have yet made as a service both to the general public and to our members.

FRED R. KLEEBERGER,

Secretary, Clinton Chamber of Commerce.

Eau Claire's Water Carnival

EAU CLAIRE, WIS.—One of the most successful civic events in the history of Eau Claire was the water fête conducted with the cooperation of the local Civic and Commerce Association at Half Moon Lake, Carson Park, in July last year. According to a count made by Boy Scouts, approximately 16,000 pedestrians entered the park by the foot-bridge, in addition to the great number of people who arrived by car from the south side of the lake. Fantastically decorated canoes and boats lent a carnival air to the scene, and in the evening flood-lamps illuminated the lake.

A program of various swimming and canoe races was arranged, and ribbons were awarded to

the winners. These events aroused considerable interest among the industrial concerns in the city, and a number of teams representing these organizations were entered. A silver loving cup was presented to the team which made the greatest number of points. Members of the local Lions and Kiwanis Clubs engaged in a canoe jousting contest, and log-rolling and fancy diving from a 45-foot tower were also featured.

The Liberty Band of Eau Claire, a musical organization of state-wide repute, is shown in the accompanying photograph rendering a concert from a specially erected raft on the lake. The material used in the construction of this bandstand was the gift of a local lumber company, and other necessary pieces of equipment, such as the canoe course, diving-tower, etc., were erected by local firms at a low cost, or free of charge.

This festival was the first of its kind held in Eau Claire, and as a result of the large attendance and splendid spirit of cooperation shown by the citizens, it will be an annual event.

ART O. HEDQUIST,

Secretary, Civic and Commerce Association.

Fourth of July Celebration and Regatta

OSHKOSH, WIS.—Preparations for a combined Fourth of July celebration, Home-Coming Week and international power-boat regatta in Oshkosh, July 3-5, are going forward under the auspices of the local Association of Commerce and other civic bodies, in cooperation with the Oshkosh Power Boat Club. A grand stand to seat 10,000 people is being erected on the shore of the lake; music will be provided for dancing at the Municipal Club House, and an impressive display of fireworks will be presented each evening.

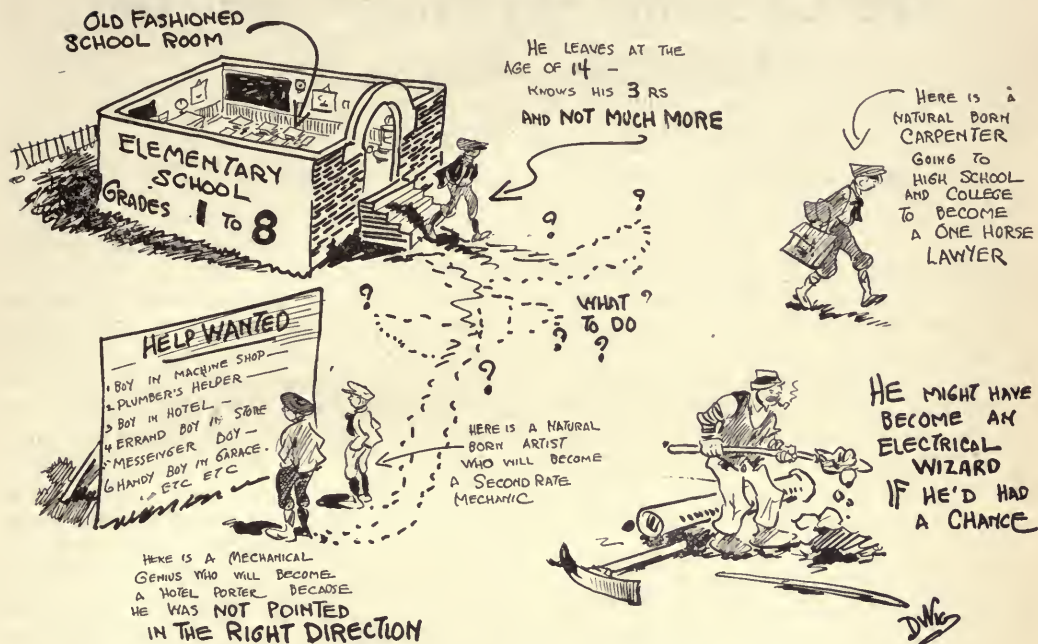
EDWARD R. SMITH,

Secretary, Association of Commerce.

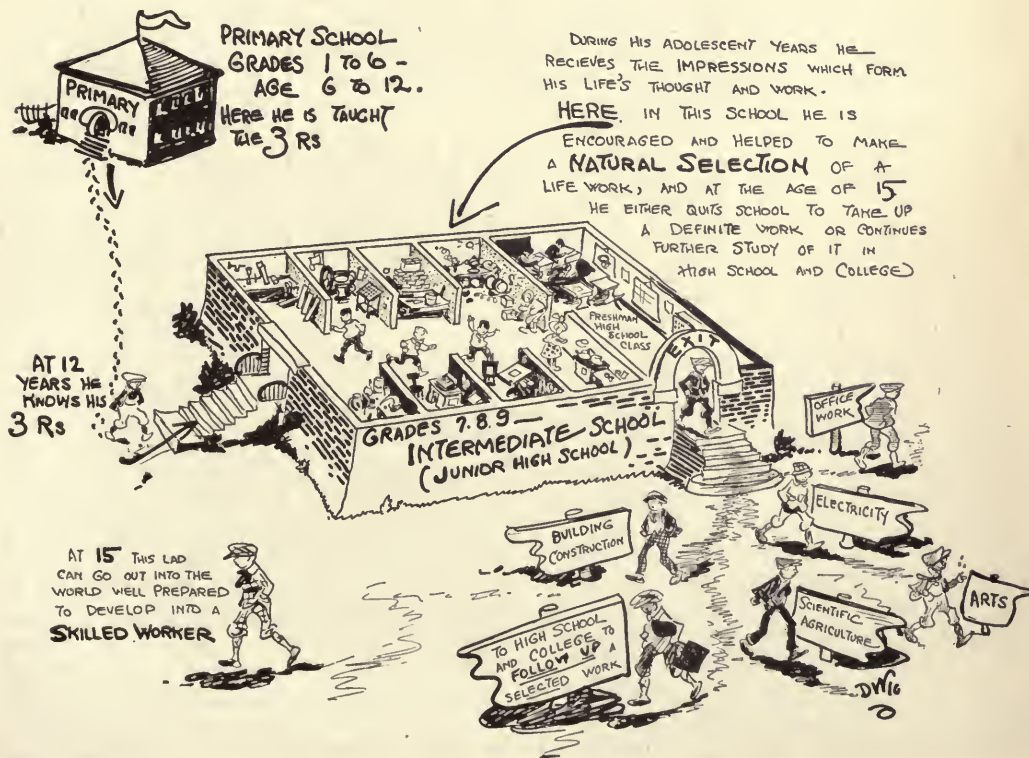


BAND-STAND ON LAKE AT WATER CARNIVAL, EAU CLAIRE, WIS.

Cartoonist and Chamber of Commerce Help Junior High Schools



These cartoons appear in a recent issue of "Plainfield," the monthly bulletin of the Chamber of Commerce of the Plainfields (N. J.), with the following caption: "Claire Dwiggs, of Woodland Avenue, famous New York cartoonist, whose 'kiddies' attend Plainfield schools, gives vivid expression to the thoughts of many parents on the school question. Those who do not understand the Junior High School scheme should study these cartoons carefully"



The Clean-up Movement and the Traveling Carnivals

By Dick Collins

Deputy Commissioner, Showmen's Legislative Committee of America

ABOUT a year ago attention was called in THE AMERICAN CITY to the clean-up campaign being waged in the outdoor amusement business for the purpose of eliminating certain evils from the various carnival organizations throughout the country. A well-known Chicago lawyer, Thomas J. Johnson, was elected Commissioner of the Showmen's Legislative Committee, which was formed to protect the interests of the legitimate showmen and to carry on the cleansing process.

During the period of somewhat over a year that the committee has now been functioning, thirty or more disreputable carnivals have been put entirely out of business and many others have been forced to change their *modus operandi*, and are now operating in a respectable, honest manner with profit to themselves and the respect of the communities they visit.

The sun has gone down on the day of the so-called Oriental dancing girl, the suggestive hula-hula, and the show for "men only." There are few disgusting snake eaters and fake "wild men" gulping raw meat. The carnival men who had money invested in worth-while shows found that they could not pander to the prurient mind and depraved taste and at the same time enjoy the patronage of the better class of citizens.

The "sure thing" grafters, found on perhaps half of the carnival midways and fairs of the country a couple of years ago, are a rarity nowadays. That some do exist and that "wide open" fairs are still operating in some sections of the country is true, but their locations are known and their graft will be exposed in no uncertain manner this year. The number of

these plague-spots has already been reduced at least seventy-five per cent.

Ninety per cent of the carnivals and circuses of the country are now members of the Legislative Committee, pledged and bonded to operate clean shows and honest games. The agreement is drastic, but it was made by the legitimate showmen themselves, and those who do not live up to it are expelled. Expulsion practically means going out of business, so strong and wide-spread is the committee's influence. Its work has been endorsed by the

leading fair associations, which will not employ carnivals that are not members of the organization. The governors of about half of the states have signed documents approving of the committee's efforts for cleanliness and right, and asking the cooperation of state, county and city officials.

The *Bulletin*, official organ of the Legislative Committee, goes to 30,000 officials and others interested in the clean-up movement, every month. In this bulletin is a list of the

How Local Officials Can Help

Editorial Note.—City officials and civic organizations desiring to help clean up the traveling carnivals can aid greatly in two ways:

(1) Do not allow any traveling carnival to give a show in your town unless its management can produce a membership certificate in the Showmen's Legislative Committee, good for the current month, or can otherwise prove to your satisfaction that the show will not be a detriment to your community.

(2) If the carnival is a member of the Committee, and if the show as given has any objectionable features, send a statement of the facts to Thomas J. Johnson, Commissioner and General Counsel, 155 North Clark St., Chicago.

members in good standing and those who have been expelled. It also contains the names of the various associations and the allied interests which are sponsoring the organization, and gives the rules and regulations, the games and shows barred, and other information.

One of the chief difficulties in the clean-up campaign experienced by Commissioner Johnson is the crooked public official still to be found in certain communities, who demands money from the showmen to operate. If they cannot or will not come to his terms, he tells them to operate such gambling games as will bring in the necessary coin, at the same time promising them protection. If they do not do

as he wishes, he has them closed up. This human leech has caused more showmen to go wrong than any other factor.

The 1924 carnival season is now on. The various caravans, some two hundred or more, are moving all over the country. The die has been cast for clean shows, and the result of this year's operation will be watched with interest by all city, county and state officials. Membership certificates of the Legislative Committee are issued monthly, and are good only for the current month, so that in case of disobedience to the laws of the association, a

member can be ousted and cannot have his next month's card.

That the public may know the members of the organization, the Legislative Committee has provided a big red sign that they display on their grounds, notifying all that the show in question belongs to the organization and giving the address of the Commissioner, where complaints or comments can be made.

(See articles on "The Menace of the Traveling Carnival" in *THE AMERICAN CITY*, page 316, October, 1922; "What Is the Matter with the Carnival?" page 401, April, 1923; and "For Clean Outdoor Amusements," page 519, May, 1923.)

Salem's Municipal Outdoor Theatre

By Oliver Goodell Pratt

Superintendent of Parks and Recreation, Salem, Mass.

SALEM, famous in American annals because of her illustrious past, is by no means relying on these laurels but is very much alive and ready to meet the modern demands. The completion of a municipal outdoor theatre is the most recent evidence of her progress.

The outdoor theatre is delightfully located at the Salem Willows Park, overlooking the ocean and the beautiful shores of Beverly and Manchester-by-the-Sea. Large willow and maple trees overhang the auditorium, furnishing shade and at the same time allowing glimpses of the blue sky overhead.

Formerly the plot of ground now called the "Willows" was used in part for hospital purposes, and in 1801 a number of willow trees were planted to furnish shade for the patients. Only two of the original trees are still standing, but new ones are still being planted to take the place of those that die.

In 1883 this 50-acre area with its beautiful groves and splendid outlook on the ocean was set aside as a public park, which has since been developed to provide healthful recreation for the people. Band concerts have been given Sundays, holidays and Wednesdays during the summer for the last twenty years. Heretofore the bands have been playing on a bandstand 16 feet square, and part of the audience has been seated among the groves of trees, while the remainder were standing in the open in the hot sun. These conditions were not satisfactory and as a consequence the idea of an outdoor theatre was conceived.

In May, 1922, Professor Frank A. Waugh was consulted and, after a study of the location, he planned the general layout of the out-

door theatre. The first draft plans were in the hands of the Superintendent of Parks when the city government made an appropriation to furnish work for ex-service men in need. The Park Commission was able to secure this money for park development purposes, and the Superintendent availed himself of this opportunity to utilize some of the labor for removing ledge and grading the area. Concrete settee standards, made by the department, were set and the foundation for the stage put in. With such a fine start as this, it was easy to convince the city government of the practicability of the idea. As a result, the necessary appropriation was granted, making possible the completion of the theatre in May, 1923. The stage was designed by A. G. Richardson, architect, and the lighting was laid out by J. H. Lynch, illuminating engineer of the Westinghouse Electric Company.

The stage is a concrete structure 2 feet above grade and 27 feet deep by 40 feet wide, with columns on back and sides and with flower-boxes on the floor between them. The stage lighting is so arranged that no shadows can be cast on the stage by performers. In addition to the overhead and side lights, opportunities are provided for portable footlights and lights for music racks.

The seating area, radiating from the stage in the shape of a horseshoe, accommodates 1,000 people in its comfortable, permanent, and roomy settees. The auditorium is lighted by neat ornamental poles with colonial lantern tops.

The entire area is enclosed by a heavy mixed planting and is approached from the higher land surrounding it by rustic masonry steps.



THE MUNICIPAL OUTDOOR THEATRE IN SALEM, MASS.

giving the theatre a most attractive setting. The shrubbery was furnished and planted by Harlan P. Kelsey, who assisted in many ways to make the project a success.

There are pavilions at the side that will seat 500 people, and the large hill in the rear, planted with maple and Scotch pines, will seat approximately 2,000 people. No matter which of the 3,500 seats a visitor chooses, the concert can be heard in comfort.

Now that Salem has this splendid theatre, it is interesting to note what use is being made of it. The program of exercises on the dedication, June 17, included music by an excellent band, songs by a soloist who has sung with Sousa's band for six seasons, and speeches by members of the Park Board, the Mayor, and

C. Howard Walker, chief architect for the St. Louis Exposition. After this opening there were band concerts every Sunday afternoon and evening during the summer, a community patriotic meeting, a vaudeville show, and a meeting of the Women's Republican Club of Massachusetts. The dramatics of the play-grounds were given here the first part of August, and the Latin Club of the local high school gave a performance in September. It is the desire of the Commission that this stage be used for all public meetings or discussions of current questions or politics—providing, of course, that it be done legally—and for dramatics, dancing performances, and exhibitions of all kinds. It is open free to the public at all times.

Motion Pictures for Special Occasions

"Film Progress," issued by the National Committee for Better Films, 70 Fifth Avenue, New York City, has as one of its features lists of pictures which may be used theatrically and non-theatrically in connection with special occasions. For instance, the March issue contains pictures suitable for special occasions such as National Music Week, May 4 to 11; Arbor Day, May 2; and Mother's Day, May 11. The April issue lists pictures suitable for Memorial Day, May 30; Flag Day, June 14; and Independence Day, July 4.



MUNICIPAL SWIMMING AND WADING POOL, MANHATTAN, KANS.

Asphalt Bottom for Swimming Pool in Manhattan, Kansas

By H. W. Alexander

City Engineer, Manhattan, Kansas

MANHATTAN is the seat of Riley County and is the home of the Kansas State Agricultural School, one of the leading institutions of this type in the country. Last year the officials of this city decided to invest in a swimming pool and chose to build it in the public park. The pool is now open to the public, the accompanying photograph giving some idea of the degree of popularity which it already has attained. It is constructed in the form of an ellipse, with a major axis of 200 feet and a minor axis of 160 feet. Every one may enjoy a dip in the cool, refreshing water during the summer months, because the depth is graduated from a minimum of 18 inches at the edge to a maximum of 9 feet in the center, where safe diving is assured from the platform which the city has erected for this purpose. From the edge of the pool to a point 40 feet out, the slope of the bottom is approximately $\frac{1}{2}$ -inch to the foot. After that there is a sharp drop to the central depth of 9 feet. It was decided to surface the 40-foot strip nearest the edge of the pool with asphalt, and the remaining area with cement concrete.

Constructing the Asphalt Bottom

After the dirt bottom of the pool had been thoroughly consolidated by rolling, a layer of gravel approximately 2 inches in thickness was spread. This served as a base for the

asphalt and in addition was intended to prevent any moisture present in the soil from coming into contact with the asphalt surface and detracting from its efficiency. Over the gravel was constructed a $2\frac{1}{2}$ -inch course of asphaltic concrete, containing 94.2 per cent sand and 5.8 per cent Texaco asphalt cement. On top of this came the sheet asphalt wearing surface, one inch in thickness, which contains the following materials: 11.8 per cent Texaco asphalt; 29.4 per cent fine sand; 58.8 per cent coarse sand. The quantity of 200-mesh and 80-mesh material in the sand was reduced considerably below what is normally used in a paving mixture.

The bottom was then ready for the water. The basin was flooded and it was observed that the asphalt was perfectly water-proof. However, the cement concrete bottom which had been constructed in the center where the pool was deepest was allowing the water to penetrate. When the basin was again emptied, the concrete was given a thorough seal coat with asphaltic cement of the same quality as that used in the asphaltic concrete bottom. When the basin was flooded for a second time, the entire bottom was found to be water-proof, and no further trouble of this nature has been experienced by the city. There has been some little trouble with ground water seeping upward through the bottom. This is caused by the marshy condition of the ground around

the pool, which holds the ground water close to the surface, creating considerable head on the bottom. Underdrains would have eliminated this trouble.

The bathers who have not yet mastered the art of swimming and who are confined to shallow water find the asphalt bottom to be an

ideal treading surface. The asphalt bottom was constructed under the supervision of B. K. Walters, Superintendent for M. R. Amerman. Mr. Walters' wide experience in asphalt work is responsible in no slight degree for the excellent results obtained in carrying out this construction.

Ellsworth--2,100 Population--Builds a Municipal Swimming Pool

By Elden R. Shaw

City Clerk and Treasurer, Ellsworth, Kans.

FOR several years there had been considerable talk about providing a place of amusement for the young people of Ellsworth. A community house, a dam in the Smoky Hill River, a municipal swimming pool and playgrounds were discussed without coming to any conclusion, until in August, 1922, a petition was circulated and signed by 225

financing the pool could be built without issuing bonds or increasing the tax levy. They then retained the services of S. A. Sulentic, consulting engineer (who had just completed a \$45,000 water-works extension job for the city) to draw plans and specifications. On March 23, 1923, bids were accepted and Mr. Sulentic was engaged to build the pool. The



MUNICIPAL SWIMMING POOL, ELLSWORTH, KANS.

citizens, calling for a special election to vote on the proposition of a municipal swimming pool. That election was a real contest, and the proposition carried, 337 voting for and 229 against.

Ways and means of financing the project were then discussed by the Mayor and Council. The City Treasurer informed them that there was a surplus of about \$5,000 that could be applied towards the cost of the pool, and the Council then decided that by careful

contract price, except sewer connections, was \$9,748. Work was started April 2 and the pool was opened July 14.

The pool is of reinforced concrete, 50 x 100 feet, from 1 foot to 8 feet in depth, and holds approximately 180,000 gallons of water. It is enclosed with a 4-foot wire fence with benches outside for spectators. On entering, bathers pass the office, where they are registered and pay for the swim, the rates being 25 cents for adults and 10 cents for children,

including towel. Suits can be rented at 10 cents or 25 cents, for cotton or wool, respectively. The dressing-rooms, 15 x 50 feet each, are on the west side of the pool and are equipped with lockers, toilets, hot and cold showers, liquid soap and drinking fountains.

The city had an old 50-h.p. boiler which was converted into a hot-water boiler and placed in the boiler house, situated between the men's and women's dressing-rooms. Water entering the pool flows through the boiler and is heated to the proper degree by an oil burner.

We drain, clean and refill the pool every week, and while the pool is in use a supply of water is kept constantly running in. This enters the pool near the bottom and is splashed out through the trough running around the entire pool at the water's level. The pool is kept sanitary by the use of chemicals.

Our largest day's receipts in 1923 were \$65, and the net earnings will run several hundred dollars per month. The record already made leads us to believe that the pool will pay for itself in the next few years, and that the taxpayers who do not swim will not be obliged to provide any of the cost of maintenance.

All in all, the new swimming pool is the most popular place in town. I believe that every town should build a municipal swimming pool and playgrounds. They are a real asset to the citizens and much appreciated by visitors, too. Auto loads from surrounding towns drive here, eat their supper in the grove and swim. Old people who do not swim go there to look on and visit. By consulting the register we found that people from 28 states as distant as Oregon, New York, and Florida, had enjoyed the privileges of a cooling plunge last summer.

The Relation of Low-Pressure Heating Boilers to the Municipal Smoke Problem

DIRECTOR E. R. WEIDLEIN, of Mellon Institute of Industrial Research of the University of Pittsburgh, has announced an investigation of public interest because of the fact that it will involve a scientific study of the relation of low-pressure heating boilers, of the type in general use in all residences, apartment houses, and office buildings, to the city smoke problem. It is expected that this research will aid materially in solving the problem of boiler requirements for specific purposes, with due consideration to fuel economy and smokeless operation. The result will be an enormous saving in coal used in American cities, and minimization of an important contributing factor to the municipal smoke problem. It will be a valuable contribution to public health.

Manufacturers have made great advances within the last few years in the design of "smokeless" boilers intended to operate within the limits set by anti-smoke ordinances. In rating the capacities of these boilers, however, manufacturers have not used uniform methods, nor has the information furnished been such that the prospective purchaser can interpret it in terms with which he is familiar, so that he may determine that he is getting what he needs—not less and not more beyond a reasonable factor of safety.

Boilers have been rated on "square feet of radiation" and it has been the practice for engineers and contractors to calculate the necessary amount of radiation, then to double this quantity to allow for losses in the line and for a factor of safety. This rule-of-thumb method results, in a large percentage of cases, in providing more boiler capacity than is necessary. And, of course, chimneys are required according to the rating of the boiler. Where several boilers have the same rating but perform differently, they will, under the present custom, require the same size stack. This requirement may in one case be entirely satisfactory; in another, it may be insufficient, necessitating the expenditure of additional money

on the part of the owner to increase the height; and in a third case it may be more than adequate. As a matter of fact, all boilers evaporating the same quantities of water do not require exactly the same amount of coal nor always the same draft.

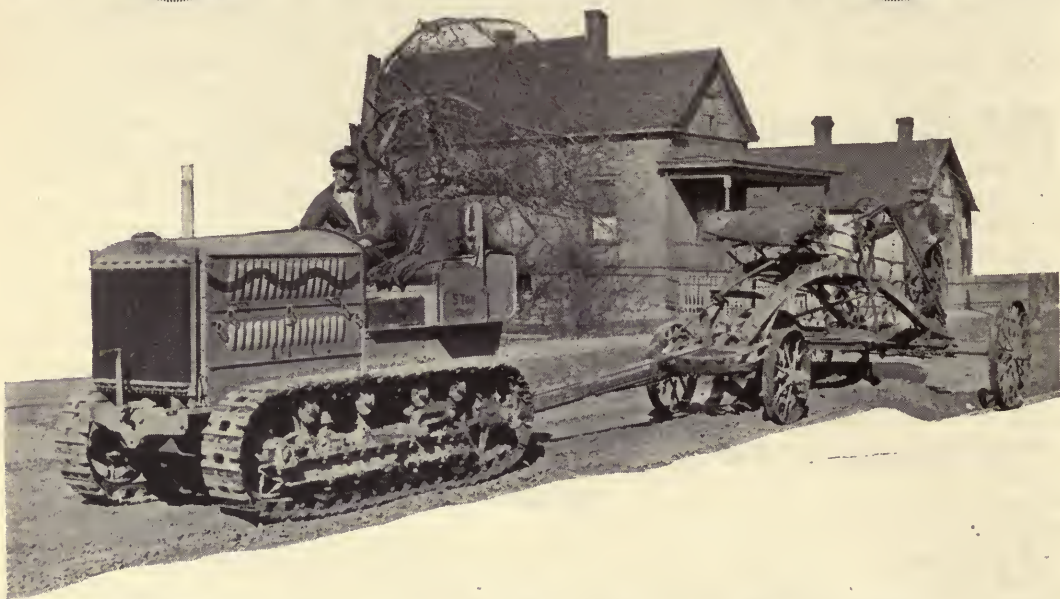
Believing that the prospective purchaser is entitled to certain fundamental information, which will enable him to know what he may reasonably expect in the matter of performance from a particular boiler, and also to enable him to know, within reasonable limits, what size boiler will satisfy his needs, H. B. Meller, of Mellon Institute of Industrial Research, and Chief of the Bureau of Smoke Regulation, of the city of Pittsburgh, after a number of conferences with manufacturers of low-pressure heating boilers, is asking each one to furnish certain information as to performance and requirements of each type and size of boiler. When this information is received, it will be tabulated and published by the Institute for the information of architects, engineers, contractors and prospective users of heating boilers. Proper factors will be included for extreme weather and other varying conditions. It is expected, also, to include simple formulas for the determination of the amount of heat required for a building under stated conditions, or the amount of direct radiation which can be figured in terms of the boiler capacity required and the size of the chimney necessary. Tests probably will be made with other types of coal, and proper conversion tables prepared, so that the standard may be adopted for any section of the country.

This work at Mellon Institute of Industrial Research, in cooperation with the Bureau of Smoke Regulation of the city of Pittsburgh, is a part of the Institute's broad study of the general problem of air pollution. The industrial aspects of the subject will receive simultaneous attention, thus continuing another investigation already begun in this field under the supervision of Mr. Meller.

THE AMERICAN CITY

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with an 8-ft. blade when the ditches are dry. I consider them the backbone of my Street Department."

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"THE NATION'S ROADMAKER"

Reducing Traffic Accidents

The Third and Last of a Series of Three Articles

By C. W. Price

Vice-President, in Charge of the Public Safety Division, Elliott Service Company, New York City

THE growing seriousness of the traffic accident situation was discussed in my first article in *THE AMERICAN CITY*, and the activities which have been found most effective for the alleviation of this situation were described in the second article of this series. The present article will point out how any city of 25,000 or more can organize and conduct a public safety campaign along tried and proved lines, and secure for such a campaign the hearty cooperation of the most important business interests and of the community at large.

The primary purpose of government is the safeguarding of human life and limb, but neither the responsibility nor the opportunity for the prevention of traffic accidents rests entirely with the municipal administration. The responsibility is shared equally by the operators of electric railways, steam railroads, and other public utilities; by the operators of commercial vehicles, such as express companies, trucking companies, taxicab and bus companies, laundries, bakeries, coal and building material dealers and department stores; and by the great army of private passenger car owners. The opportunity for preventing accidents rests almost as much with civic, social and commercial agencies as with the various departments of the municipal administration.

Steps in Organizing a Community-wide Public Safety Campaign

The first step, therefore, looking toward the organization of a community-wide public safety campaign should be the calling together of representatives of these two groups of interests—those who are jointly responsible for most accidents, and those who have it in their power to bring about reductions in the total number of such accidents. Such a conference may appropriately be called by the mayor or other executive officer of a municipality; though in certain communities, because of special local conditions, it is desirable to arrange for the calling of such a meeting by an outstanding citizen. In either event the person who calls the meeting to initiate a safety campaign should, himself, first be convinced that it is possible to prevent accidents

and that such a movement is necessary in this particular community, and he must be a man who will be acceptable to all political and other factions in the community.

There should be present at this conference the chief of police, the superintendent of schools, the street commissioner, the chief of the fire department, the city coroner, the commissioner of health, the manager or the president of the local electric railway, an executive officer from each of the other local utilities, the president of the local federation of women's clubs, the highest representative of each of the more important religious denominations, the president or executive secretary of the local chamber of commerce or board of trade, the president or secretary of the automobile club, and representatives of the other interests mentioned earlier in this article.

At this conference the experiences of other cities with permanent safety campaigns, and the activities that have proved to be successful in those cities, should be described so that the leaders of the community may be convinced of the necessity for, and effectiveness of, such a campaign as is contemplated and that they may have a clear understanding of the fundamental principles of a successful safety campaign. They must, for instance, be made to appreciate the difference between spectacular, temporary activities—such as a jay-walking demonstration by a professional clown or the use of Boy Scouts for a few minutes as traffic officers—and permanent, far-reaching activities such as daily safety instruction in the public schools or the safety training of commercial vehicle drivers.

This conference should lead to the organization of a permanent safety committee or Safety Service Bureau, representative of all of the interests, but functioning through the local chamber of commerce, board of trade or some similar organization which is influential and in good repute throughout the community. It is recommended that the Safety Service Bureau function as a division or department of an existing organization, because in almost every city there is a strong prejudice among business men against the creation of new organizations, the desire being to centralize so far as possible activities which have for their

City of Richmond commends Autocar performance

Mr. M. C. Smith, Assistant to the Director in the Dept. of Public Utilities, Richmond, Va., wrote the following letter to the local Autocar Factory Branch:

"It is a pleasure to advise you that our 4-cylinder 2- to 3-ton Autocar equipped with Mead-Morrison winch and pole raising derrick has been entirely satisfactory and successful.

"We have had occasion to use it for pole raising purposes as well as drawing in very difficult underground cable jobs. It is hard to estimate exactly the saving in labor that has resulted from the use of this truck, but I am satisfied that in one job alone, namely, the Broad Street Lighting, the saving in labor, to say nothing of time, will amount to at least one-third of its cost.

"I do not frequently write such letters, but it is a pleasure to let you have this."



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purpose the improvement of community life. The designation of the group which is to conduct the campaign as the "Safety Service Bureau" is recommended, because this name suggests what should be the primary purpose of the organization—to render safety service. There is already evidence of a strong reaction against safety organizations which are such in name only and which render no service to the community. The detrimental effect of

of detailed instructions for carrying out the plan and using the safety material. There is no longer a need or an excuse for experimentation. Any city can now start in at the point where Washington, St. Louis and other cities have arrived.

Its Cost—Investment Rather Than Expense

What will a thorough-going community-wide safety campaign cost? Surprising as it



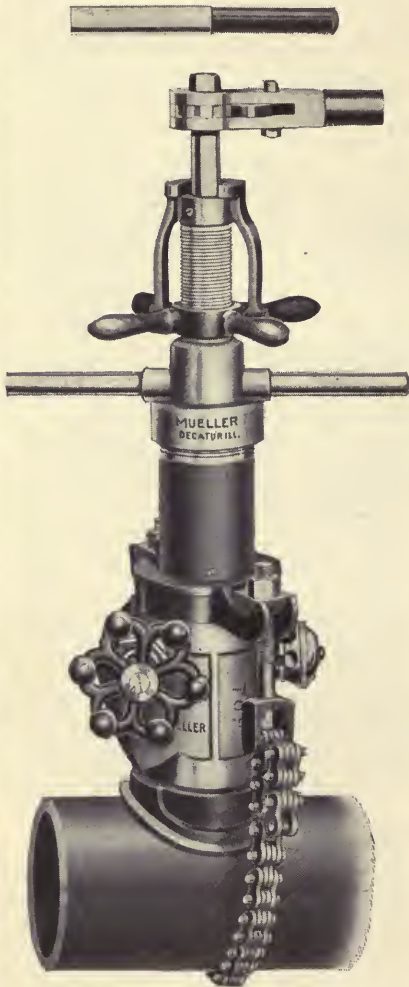
BOOKLETS USED FOR INSTRUCTION IN SAFE DRIVING

such organizations and of paper safety campaigns—campaigns which do not really exist except for a little newspaper publicity—has been pointed out in an earlier article.

I cannot make too strong the statement that no safety campaign should be undertaken unless it is to be a sincere, permanent, and community-wide campaign. Fortunately, because of the experience of some two dozen cities during the last six years, it is no longer a difficult matter for any American city to organize such a campaign. It is now a simple matter for any city to avail itself not only of the plan for a public safety campaign which has been found effective in many cities, but of the actual materials used in these cities and

may seem, in view of the fact that we are killing 15,000 people a year through motor accidents alone, such a campaign in the average American city costs less than the accidental death of one person. A public safety campaign such as has been described in this series can be conducted in any American city at a cost of from \$1,000 to \$10,000 a year, depending on the size of the city.

What few realize, however, is that the cost of a public safety campaign is no longer an expense, but rather an investment which yields extraordinary dividends. Entirely aside from the humanitarian consideration—which always has been and must continue to be the paramount consideration in public safety cam-



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will tap water mains and insert corporation stops from 1" to 2" in size, in pipe under pressure. Other models of Mueller Tapping Machines specially designed for different conditions. More than 90% of all tapping machines in use today are Mueller-made. Write for complete descriptions and prices.

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paings—there is now a concrete economic reason for doing everything possible to reduce accidents, and that is the possibility of saving money through reductions in automobile accident insurance rates, reductions in the cost of municipal government, reductions in accident costs to industries, utilities and citizens.

Saving in Automobile Accident Insurance

Let us consider the possibilities of financial savings in just one of these fields—that of automobile accident insurance. Contrary to popular conception, the insurance companies are as anxious as any one else to have insurance rates as low as possible, because the lower the rates, the easier and the more profitable it is to sell insurance. The public also fails to realize that insurance rates are based directly on the insurance companies' losses, and that the rates for automobile accident insurance have risen steadily during the last ten or fifteen years only because the number of accidents and the claims paid by insurance companies as a result of these accidents have risen steadily during this period.

As indicated in a statement by the National Bureau of Casualty and Surety Underwriters—the rate-making and administrating body for the principal insurance companies of the country—reported in *THE AMERICAN CITY* for February, 1924, the rates for automobile accident insurance in each city are now based directly on the insurance companies' losses in that city. In other words, it is now possible for any city practically to determine its own rates for automobile accident insurance by reducing its motor-vehicle accident record. The full significance of this becomes apparent when it is known that more than \$200,000,000 a year is now being spent for automobile accident insurance in the United States. On January 1 of this year the National Bureau of Casualty and Surety Underwriters put into effect a new schedule of rates for public liability insurance on motor vehicles which increased the cost of such insurance in those cities whose accident experience has grown worse during recent years and reduced the

cost of automobile insurance in those cities which have been able to reduce their automobile accidents and thereby the insurance companies' losses. The reductions were as high as 20 per cent in some cities. It is possible, therefore, for any city, through a campaign which will bring about a permanent reduction in traffic accidents, to save in this one item of motor vehicle insurance not only the cost of the entire safety campaign, but ten times or more that cost each year. And this doesn't take into consideration the very substantial saving to the industries and to public utilities which directly benefit through a community-wide safety campaign.

Prorating the Budget

It has been my experience in city after city that when business men are made aware of these facts, they are not only willing but glad to finance a thorough-going community-wide permanent safety campaign and that they look on their contributions not as donations but as investments. The budget for such a campaign should be proportioned on a pro rata basis to those business concerns which will benefit financially from a reduction in accidents; such as the street railways and other public utilities, the operators of commercial vehicles, and the principal industrial concerns, and—where it is possible to reach them through an organization—the owners of private passenger cars.

Because of these possible savings to various business interests; because the accident situation is created largely, though unavoidably, by the operations of many of these interests and, therefore, can be controlled only through the cooperation of these interests; and, finally, because no public safety campaign has ever been successful without the cooperation of all of the interests mentioned in this article, it is futile for any municipal administration to attempt to conduct a safety campaign through its own machinery, and it is futile for any group of interests in a city to attempt such a campaign without the hearty cooperation of the entire municipal administration.

Fire-Fighting Convention and Demonstrations at British Empire Exhibition

THROUGH Chief James J. Mulcahey, of Yonkers, N. Y., as Secretary of the International Association of Fire Engineers, an invitation has been extended to the fire chiefs of the United States to attend the annual meeting of the Professional Fire Brigades' Association, of England, to be held in London, July 1-3. The invitation comes from J. T. Burns, Honorary

Secretary of the English organization, on behalf of the President and members of the Governing Council of that body. The forenoons of the three days of the convention will be devoted to business sessions, the afternoons being left free for inspections and demonstrations of the fire-fighting appliances on the grounds of the British Empire Exhibition.

Grove Street, Sewickley, Pa.,
Tarvia-built 1911. Picture
shows the perfect condition
of the street today—after
13 years of grinding traffic.



This car was modern in 1911 —the street still is

“HORSELESS carriages” we called them. Funny-looking contraptions, weren’t they? Look at our picture. That top! That awkward rumble seat! Cars like this disturbed the peace and quiet of Sewickley, Pa., back in 1911—the year when Grove Street was Tarvia-built.

Thirteen years ago! Yet this Tarvia-built street is still in perfect condition in spite of years of traffic.

Tarvia streets can be maintained indefinitely at little cost—only economical maintenance is needed to

make a Tarvia pavement last indefinitely. And in addition:

A Tarvia pavement will not wave, roll or rut.

A Tarvia pavement will remain skidproof because of its granular surface.

Thousands of Tarvia streets and roads have proved to taxpayers that—for the money spent—Tarvia gives more miles and the most years of satisfactory highway service. Every paving requirement—construction, repair or maintenance—can be met with Tarvia.

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For Road Construction
Repair and Maintenance

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The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Right to Regulate Objectionable Performances in Theaters

"GENERALLY speaking, a city, under its police power, may regulate any business the unrestrained pursuit of which might affect injuriously the public health, morals, safety, or comfort," declared the Minnesota Supreme Court in the comparatively recent case of *Power vs. Nordstrom*, 184 Northwestern Reporter, 967. "And in respect to theatrical exhibitions and amusements of a similar character a larger discretion is recognized than in the case of ordinary trades, because they are liable to degenerate into nuisances and also because they require more police surveillance."

In the case of *Message Photo Play Co., Inc., vs. Bell*, 166 New York Supplement, 338, the Appellate Division of the New York Supreme Court recognized the right of municipal authorities to prevent the exhibition of a film favoring birth control. The Court denied the producer's right to invoke the constitutional guaranty of freedom of speech. The opinion reads, in part:

"It has been authoritatively settled that it is not only competent for the Legislature of the state to require a license for public theatrical and motion picture exhibitions, but also to censor such productions, in order that they may be regulated in the interest of morality, decency, and public safety and welfare."

"The nature of the subject dealt with by this motion picture in itself is evidence that there is room for an honest opinion on the part of the defendant [municipal Commissioner of Licenses] that the presentation of the photo-play will be injurious to public morality, decency, and welfare. The Legislature has declared it to be against the public interests to have contra-ceptive information disseminated."

"I am of the opinion that the action of the Commissioner [in denying permission to exhibit the film] is justified, both in the interests of public decency and public welfare. . . . He would surely have the right to forbid, under pain of revocation of the license, a production that would, by reflecting upon race or religion, inflame or incite part of the community to disorder. He would in time of war be authorized, and it would be his duty, to prevent any exhibition at a licensed theater that might be to the prejudice or disadvantage of the state or nation. The exercise of such authority

would be well within the police power of regulation for the public welfare."

A city, under general authority granted to it to adopt and enforce all necessary police ordinances, may suppress by ordinances a show which is against decency or public morals, held the Illinois Supreme Court in the case of *Chicago vs. Shaynin*, 101 Northeastern Reporter, 224.

The history of the law on this subject does not disclose any material change in recent years in public policy, so far as concerns the abstract rule that theatricals may be regulated in the interest of the public morals and welfare. But notions as to what particular kinds of entertainment are prejudicial to the public have proved to be rather elastic.

The present generation will be both amused and amazed to hear that in 1852 a New York court sustained a conviction, under circumstances detailed below, and under a statute providing that "no person shall exhibit or perform for gain or profit, any puppet-show, any wire or rope dance, or any other *idle* shows, acts, or feats, which common showmen, mountebanks, or jugglers usually practice or perform."

The defendant in this case (*Thurber vs. Sharp*, 13 Barbour's Reports, 627) contended that the exhibition provided by him for the entertainment of the public came within neither the language nor the spirit of the act. But, alas! he lived too soon to be able to convince the court of the soundness of his contention. To-day he might be a headliner on a vaudeville circuit, but he was condemned to pay a \$25 penalty for the benefit of the poor of the town of Delhi. The presiding judge said:

"The defendant and his troupe are whites, but on the occasion in question they appeared on a platform in the court-house at Delhi, dressed and disguised as negroes, and one of them as a wench dressed in Bloomer costume. They sang negro songs, performed dances in grotesque manner, gave mock psychological lectures and mesmerized each other, and performed feats with chairs on their heads."

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Ornamental Iron Fence and Gates



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Let us know your requirements in either Iron or Chainlink Wire Fence and we will submit designs and estimates of cost

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"The World's Greatest Iron Fence Builders"

"I am of the opinion this exhibition is one prohibited by the statute. A juggler is one who practices or exhibits tricks by sleight-of-hand—one who makes sport by tricks which make a false show of extraordinary dexterity. One trick, that of mesmerizing the leg and arm of one of the party, so as to make them stiff and immovable, was a false show over the mind and body of another. It is enough that one of the acts exhibited

on the occasion is within the prohibited acts, although other parts of the performances are not.

"Again, these performances, or a part of them, come within the definition of mountebankery, or boastful and vain pretensions. Appearing as negroes, imitating their dress, language and actions, and performing pretended feats as psychologists, clearly brings this kind of exhibition within the words and spirit of the act."

Sundry Items of Municipal Law

Liability of City for Premium on Policeman's Bond

Provision in the Omaha charter that the cost of all official bonds shall be paid from the general funds of the city includes premiums on policemen's bonds, according to the decision of the Nebraska Supreme Court in the recent case of *Wheeler vs. City of Omaha*, 196 Northwestern Reporter, 894.

City Under Provision in Charter Held Authorized to Change Street Names

Charter power given the city of Tacoma "to provide for naming streets" authorized adoption of ordinance changing the name of a residential street, the Washington Supreme Court decided in the case of *Eldridge vs. Fawcett*, 223 Pacific Reporter, 1040.

Personal Liability of Officials in Awarding Municipal Contracts

Municipal officials who participate in the payment out of the public treasury under a contract tainted by fraud or collusion may be compelled to restore the funds, according to a decision of the Wisconsin Supreme Court handed down in the late case of *Ellefson vs. Smith*, 196 Northwestern Reporter, 834. But it was decided in the same case that although a contract to build a municipal reservoir was let by officials of a city without specifications being on file with the city clerk and without advertising for bids, in violation of a statute, money paid under the contract could not be recovered in a suit brought by a taxpayer where the improvement was a public necessity, and there appeared to the officers to be an emergency requiring immediate construction of the reservoir, and where the city had the full benefit of the improvement at a fair price.

What Constitutes a "Hard-surfaced" Highway?

In the case of *McDonald vs. Fraleigh*, 98 Southern Reporter, 830, decided by the Florida Supreme Court, question was raised whether or not public funds raised to construct "paved, macadamized or other hard-surfaced highways" could be used to construct sand-clay roads. The Court held that injunction against proceeding with a contemplated improvement was properly denied, it being assumed that the proper officers would require under contract still to be awarded such materials and character of construction as would comply with the law. The Supreme Court remarked:

"Because of the conflicting professional opinion and a practical experience tending to the contrary, it would not, we think, be in accord with sound reason to hold, as a legal conclusion, that a road surface, which may properly be classified as 'hard-surfaced' within the meaning of the statute, is incapable of fabrication by an application, in sufficient quantity and proper combination of sand and clay suitable for the purpose. On the other hand, it is perfectly apparent that an improper or unbalanced mixture or combination of sand and clay, or what would otherwise be a proper combination, but of unsuitable material for the purpose, or an insufficient quantity, even though of suitable material and in proper combination, or a sufficient quantity of suitable material in proper combination, but without adequate foundation for the proposed road or proper drainage when necessary, would not produce a hard-surfaced road in fact, and, therefore not hard-surfaced within the meaning of the statute. These, however, are practical considerations of fact, depending for their solution upon each case as it arises."

Abandonment of Municipal Public Utility Property

The fact that an electric light plant was constructed by a municipality out of funds raised by a bond issue voted by the electors did not preclude the board of trustees from abandoning a part of the property, without holding an election on the question of abandonment, if the property had become unsuitable or unprofitable for use. (*Oklahoma Supreme Court, Moomaw vs. Sions*, 220 Pacific Reporter, 865.)

Municipality Operating Street Railway Liable to Patrons as a Private Owner

Said the Washington Supreme Court in the recent case of *Tobin vs. City of Seattle*, 221 Pacific Reporter, 583:

"We cannot agree with the respondent's contention that the alleged acts of negligence were those required to be done by it while acting in a governmental capacity. The city owned and operated this street railway system in its proprietary capacity, and whatever duty it owed to its patrons would be those which the law imposes upon it while acting in its private or proprietary capacity. . . . Generally speaking, a municipality which owns and operates a street railway owes the same duties to its patrons that a private owner and operator would owe to his patrons under the same circumstances."

Asymmetric Ornamental Street Lighting

(Non-symmetrical light distribution)

—is now a practical achievement

THE new Holophane Bilux Refractor turns out on the street the "backward" light which would otherwise be wasted on lawns and buildings. Also, like other refractors, it turns downward a large part of the upward half of the light of the lamp and it distributes all of this redirected light over the street area in the most effective manner. The result is *efficient, even, brilliant* illumination on the street.

The Holophane Bilux Refractor which surrounds the lamp is in turn surrounded by an ornamental lantern or globe. This outer

envelope is made of lightly-diffusing glass which modifies only slightly the light distribution of the refractor. Thus, high efficiency in the use of light is accomplished with street lighting units which are ornamental in character and which are available in many different designs.

The Holophane Bilux Refractor is supplied by the Holophane Glass Company exclusively through the Westinghouse Electric & Manufacturing Company, whose ornamental street lighting units now include this new and exceedingly efficient type of Holophane Refractor.

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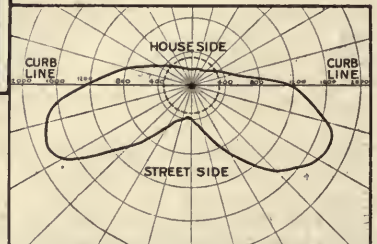
In Canada: Holophane Co. Ltd., 146 King Street West, Toronto

Below is illustrated one of a number of Westinghouse Ornamental Units using the Holophane Bilux Refractor.



Above is illustrated the Holophane Bilux Refractor.

The curve below shows how completely the Holophane Bilux Refractor directs the light out on the street where it is useful. Drawn from a test by the Electrical Testing Laboratories, New York.



HOLOPHANE

DIRECTS LIGHT SCIENTIFICALLY

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of
THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Recent Zoning Ordinances and Enabling Acts

BAKERSFIELD, CALIF.—Ordinance approved August 6, 1923

MASSACHUSETTS.—Chapter 133, Acts of 1924 (re Board of Appeals making variances), signed by Governor March 24, 1924, effective June 22, 1924

DEDHAM, MASS.—Ordinance passed May 5, 1924

LEXINGTON, MASS.—By-law approved April 8, 1924

WINCHESTER, MASS.—By-law approved March 25, 1924

NEW YORK.—Amendment of Greater New York Charter providing for penalty actions, Chapter 295, Laws of 1924

NEW YORK.—Amendment of village law, Chapter 492, Laws of 1924

LYNBROOK, N. Y.—Ordinance adopted March 17, 1924

Recent Discussion of Regional Zoning

There is in this country and, indeed in the entire civilized world, a growing appreciation of the necessity of the planning of entire regions as a whole; for in no other way can the common needs of the region be satisfied economically and efficiently and the conflict of local regulations avoided. In regional planning, regional zoning is an essential part.

In regional zoning the first problem to be solved is the devising of zoning regulations suitable not only for the built-up portions of the region—the zoning that we in this country have almost exclusively undertaken—but the formulation of the very different rules suitable for the outlying areas, as yet largely or entirely undeveloped. The purpose of these rules should be to preserve the territory from sporadic uses which may interfere with its best use later on; but not to prevent its utilization meanwhile.

A second purpose to be accomplished in regional zoning is to prevent a conflict between local regulations. There is a natural tendency to zone more or less objectionable uses into the outskirts of the community, or to forbid them altogether within its limits. In both cases neighboring communities may be injured, especially if the communities in question are small in area. One solution of this problem, upon which the citizens of Nassau County in the state of New York will soon vote, was described in our November "Zoning Notes." Another solution has been on various occasions proposed by Dr. Robert Whitten, the city planner of Cleveland, Ohio, and was recently put by him in the following language:

"In the planning of metropolitan communities it is desirable in many cases to assure the permanent self-contained existence of some of its suburbs by separating them from each other and from the central city by a strip of park, farm or other open development use. Almost any use that requires

large acreage and a small percentage of cover and that does not draw large crowds of people to it daily can be properly located in this encircling strip. Among the uses other than agricultural that seem appropriate are: large parks, parkways, playfields, forest reservations, golf and country clubs, private estates, cemeteries, water-supply reservoirs and filter-beds, terminals, city, county and state farms and institutional buildings, private institutions occupying large acreage, fair grounds, sewer treatment works, truck gardens, greenhouses and railroad car storage and classification yards.

"Under a development plan, carefully selected areas could be zoned for open development uses. With good judgment in the selection of areas for inclusion, land values should be affected favorably rather than otherwise, as by segregating the open development uses, these strips would have a much more certain and less distant prospect of development. Provision should also be made for a modification of tax and assessment laws so as to prevent the taxation of land in open development strips to support municipal services that are primarily occasioned by, and of benefit to, the distinctly urban areas. In exceptional cases land included should be entirely exempted from taxation. Open development strips, while essential to the proper planning of a metropolitan region, are not in general practical of attainment unless planned for long in advance of any urban development in the immediate vicinity. In fact, in any of our great urban regions, existing conditions of development, transit facilities and land values make it quite impractical to work out the open development strip idea except as to limited portions on the outskirts of the metropolitan area.

"The success of this proposed rather radical extension of planning powers over development districts will depend very largely on the wisdom, fairness and moderation with which such powers are applied. Given a wise, fair and reasonable administration and any measure really required in the public interest will pass safely through the seas of individual antagonism and judicial criticism."

A third problem is that of administration. Obviously the zoning of a region can best be done originally and maintained and varied so far as necessary from time to time by an authority with power, in this respect, for the region as a whole. In this way also conflicts between local zoning regulations are eliminated. Politically and practically, however, home rule for the various local authorities of the region must be preserved in all the other matters of local concern. The ideal solution is supervision by a superior authority in zoning and planning matters. This is the way in which all regional planning is done in foreign countries that have been successful in such planning. There is nothing incompatible between local home rule and central supervision. The state is not in



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No other smooth-surface paving material equals it in ability to stand the wear and tear of traffic. That's why more than 290,000 square yards of Trinidad Lake Asphalt paving have been laid in York, Pa.—splendid streets like the one shown above.

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fact administering local matters in such supervision, but only seeing to those phases of the subject to be administered which are of general importance. This fact has often of late been pointed out in discussions of regional planning in all its branches. It must be remembered, however, that

such a solution would not as yet, at least, be acceptable in this country outside the city planning ranks, or even altogether within them. Evidently regional planning, and regional zoning as a part of regional planning, is a problem still far from a practical solution in this country.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor of *The Bond Buyer*

FOLLOWING the lead of the United States Liberty Loans, municipal bonds advanced in price sharply during the early part of May and this improvement has encouraged many communities to offer their authorized bond issues for sale at this time rather than take a chance on the market of next summer or fall. New York City, for instance, is expected to be one of the borrowers in the market for funds before July 1, the civic authorities having recently witnessed an advance in the market value of outstanding New York City issues, which encourages the belief that a new issue could be sold at a net interest rate of $4\frac{1}{4}$ per cent or less. New York City has not issued long-term bonds for over two years, the financing of improvements being arranged temporarily through the sale of short-term notes which may be renewed from year to year. This method permits the city to wait for a favorable bond market in which to float its 50-year corporate stock issues.

The easy condition of the money market and the improbability of the value of tax-exemption being impaired by new tax legislation are the main factors supporting the municipal bond market at this time. If predictions regarding the early return of business activity prove correct, the bond market is probably near the top. But so long as business continues as quiet as it is at this writing, there appears to be no reason why high-grade securities, such as state and municipal bonds, should not continue firm at current levels or even advance slightly.

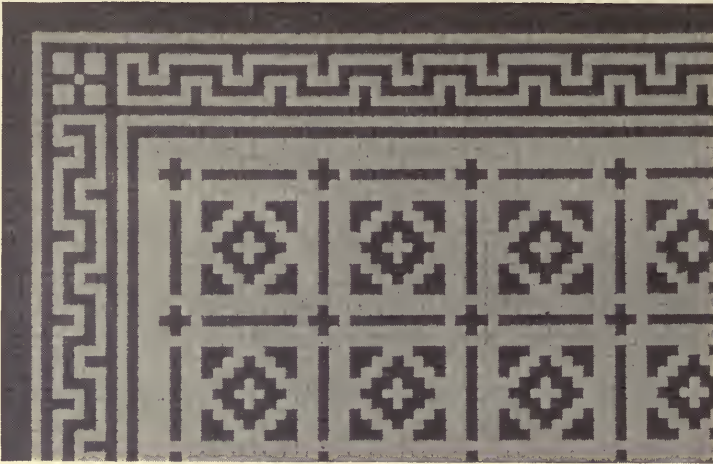
We present in this issue a list of Municipal, County and District Bond Sales of over \$1,000,000 in 1923, the information having been taken from "Municipal Bond Sales for 1923," published annually by *The Bond Buyer*.

MUNICIPAL, COUNTY AND DISTRICT BOND SALES OF OVER \$1,000,000 IN 1923

Jefferson Co., Ala., Road.....	\$1,000,000
Salt River Valley Water Users' Ass'n, Ariz.	1,800,000
Harrisburgh, Ark., Drain. Dist. No. 7.....	1,440,000
Little Rock, Ark.....	1,315,000
Long Beach, Calif., Southern Counties Gas Co., Properties Purch.....	3,000,000
Los Angeles, Calif., 14 issues totaling.....	29,350,000
Merced Irri. Dist., Calif., Irrigation.....	1,320,000
Denver, Colo., School District and Water.....	3,000,000
Moffatt Tunnel Imp. Dist., Colo.....	6,720,000
Waterbury, Conn., Funding.....	1,490,000
Duval Co., Fla., Road.....	1,050,000
Everglades Drainage Dist., Fla.....	3,500,000
Hillsborough Co., Fla., Highway.....	1,500,000
Miami, Fla., Municipal Improvement.....	2,730,000
Pinellas Co., Fla., Highway.....	2,597,000
St. Petersburg, Fla., City.....	1,087,000
Tampa, Fla., Water-Works Purchase.....	1,350,000
Atlanta, Ga., Water-Works and School.....	3,501,000
Chicago, Ill., Lake-Front Extension, Stadium, and Park Improvements, and Sanitary District, 8 issues totaling.....	14,840,000
Cook Co., Ill., Forest Preserve District,	

Series "J".....	\$2,000,000
Indianapolis, Ind., School District.....	1,650,000
Louisville, Ky., Sinking Fund.....	1,000,000
Caddo Parish, La., School.....	1,000,000
Calcasieu Par., La., Navigation Channel....	2,750,000
New Orleans, La., Paving.....	1,050,000
Rapides Par., La., Improvement, Road and Refunding.....	4,000,000
Baltimore, Md., General Improvement, Water and School.....	6,394,000
Boston, Mass., Temporary Loans, 6 issues totaling.....	12,000,000
Essex Co., Mass., Tuberculosis Hospital....	3,260,000
Hampden Co., Mass., Temporary Loan.....	6,600,000
Detroit, Mich., 10 issues totaling.....	23,663,000
Lansing, Mich., Electric Light and Power..	1,000,000
Wayne Co., Mich., Home for Feeble-minded	1,000,000
Hennepin Co., Minn., Road.....	2,000,000
Minneapolis, Minn., School.....	2,350,000
Ramsey Co., Minn., Road and Bridge.....	3,000,000
St. Louis, Co., Minn., Road.....	1,500,000
Kansas City, Mo., Water.....	2,500,000
St. Louis, Mo., Public Building and Improvement.....	2,500,000
Omaha, Nebr., School District.....	1,500,000
Jersey City, N. J., School, General Improvement and Tax Revenue Cert.....	6,574,000
Newark, N. J., School.....	1,099,000
Trenton, N. J., School Funding and General Funding.....	3,068,000
Albany, N. Y., School.....	1,560,000
Buffalo, N. Y., School and Water.....	4,500,000
New York City, N. Y., 76 issues (consisting entirely of short-term tax bills, revenue notes and corporate stock notes) totaling..	502,279,200
Rochester, N. Y., Schools, Local Improvement and Revenue Notes.....	6,275,000
Greensboro, N. C., Street Improvement....	1,000,000
Akron, O., Trunk Sewer, School.....	3,700,000
Cleveland, O., Water-Works.....	6,740,000
Seneca Tp., O., Road Improvement.....	1,000,000
Oklahoma City, Okla., School District.....	1,900,000
Tulsa, Okla., Water-Works.....	2,800,000
Multnomah Co., Ore., School Dist. No. 1....	1,000,000
Portland, Ore., Refunding Water.....	2,200,000
Allegheny Co., Pa., Road and Tunnel.....	3,650,000
Crawford Co., Pa., Road.....	1,000,000
Northampton Co., Pa., Road and Bridges..	1,000,000
Philadelphia, Pa., 4 issues totaling.....	13,500,000
Pittsburgh, Pa., School District.....	3,000,000
York Co., Pa., Road.....	1,000,000
Woonsocket, R. I., Funding.....	1,000,000
Knoxville, Tenn., Public Improvement....	1,367,000
Memphis, Tenn., Water.....	1,500,000
Corpus Christi, Tex., Sea-Wall and Breakwater	2,000,000
Dallas, Tex., Street Improvement and Schools	2,250,000
Fort Worth, Tex., Water and Sewer.....	1,500,000
Galveston, Tex., Grade Raising.....	1,250,000
Harris Co., Tex., Navigation District.....	4,000,000
Hidalgo Co., Texas, Water Improvement District No. 4.....	1,250,000
Nueces County, Tex., Navigation District..	1,000,000
Paris, Tex., Water-Works.....	1,000,000
San Antonio, Tex., Ind., School District....	1,000,000
Wichita Co., Tex., Irrigation District No. 2	1,760,000
Salt Lake City, Utah, Tax Anticipation Notes	1,900,000
Norfolk, Va., Public Improvements, Water-Works and Port Terminal.....	6,599,000
Richmond, Va., Shockoe Creek Sewer System	1,500,000
Pierce Co., Wash., Tacoma School District No. 10.....	2,400,000
Seattle, Wash., Municipal Light and Power.	2,520,000
Charleston, W. Va., Ind., School District....	1,350,000
Milwaukee Co., Wis., Metropolitan Sewerage and City Plan.....	6,700,000

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Alundum Tile is now being made in the ceramic mosaic sizes, $\frac{3}{4}$ in. square and 1 in. hex., and in colors, brown, buff, gray, green, salmon, and white.

Alundum Ceramic Mosaic Tile may be used exclusively or in combination with vitreous or glazed tile, thereby attaining a non-slip ceramic mosaic floor.

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From the International Union of Cities

Regional Planning in France.

71.2 (44.93)

Towns along the coast of the Department of The Var in France have joined together for the purpose of preparing a regional plan study. The law of the 14th of March, 1919, explicitly provides that when a planning project is of such a nature as to interest several communities of any Department, the Prefect may officially authorize intercommunal conferences with the purpose of constituting a "syndicate." This is just what the Prefect of the Department of The Var has now done with regard to 26 communities extending along the coast line of this Department. All of these towns have now approved this initiative and voted funds for the support of the "syndicate" and for studies for a regional plan by a well-known city planner. This plan, drawn to the scale of 1/10,000, has been exhibited at a recent City Planning Congress at Strasbourg; it will now be submitted to the approbation of the various authorities. The plan allows each community a considerable amount of liberty and gives to each the responsibility for preparing detailed plans which concern the separate localities without permitting them to destroy the unity of the general plan. The part played by the "syndicate" in providing for water-supply, gas and electricity for all these communities is to be noted. "La Cote d'Azur" of the Department of The Var will profit immensely in the future when this work is accomplished.

No. 340

Economy and City Planning in Germany.

71

City planning economy as understood to-day in Germany admits, first of all, the fact that future towns are no longer to be formed as a result of great agglomerations around a center, but, on the contrary, in such a manner as to decentralize the population over broad areas. As to industries (at least those that are not bound by their special requirements to definite situations), these will be assigned at the very beginning to determined sections which will be strictly reserved for them, then there will be reserved as much as possible of the best farming lands for agricultural purposes. Certain forest-clad areas will be definitely set aside for the recreation of the people. Industrial zones and agricultural zones once determined, residential zones will indicate themselves. As to housing; buildings of one, two, or three stories at the most, are those which are best adapted to present-day economic conditions. One of the most important questions for the future—for economic developments as well as for housing colonies—is that of circulation. City planning should be able to reconcile the requirements of the three great elements—industry, housing and circulation.

No. 333

City Planning Institute of Canada.

71 (71) (072)

The City Planning Institute of Canada has just been officially recognized by the Canadian Secretary of State, who, in a letter which is reproduced in the proceedings of the Institute, defines city planning as "the scientific and methodical disposition of land and of constructions thereon in regard to their use and their importance with the purposes of avoiding congestion and of assuring good economic and social returns as well as the health and the well-being of all in both urban and rural communities."

No. 339

The French City of Lille Prepares a Plan for Extension.

71.31 (44.28)

A competition has recently been held for plans for the extension of the city of Lille, France. A review of the various plans presented shows that great importance has been placed upon the problem of circulation, especially as it affects home life. Market places are provided at the Grand Place and the Place du Theatre. A new railroad station is planned, the old one to be removed. Judicial, religious, educational, administrative and business centers are established. The area covered by the plan is 12,356 hectares and includes 38 existing communities. The old encircling fortifications are to be dismantled and the area utilized for parks and boulevards. The existing beauty of the city is to be safeguarded. Better sanitary conditions are proposed for existing, unhealthy districts, and the concentration of several hospitals is provided for in the southwestern portion of the city.

No. 341

City Planning in French-Africa.

71.31 (6)

Grand Bassam, on the so-called "ivory coast" of Africa, exemplifies what French effort has been able to accomplish in the rapid improvement of the sanitary conditions of a very unhealthy native town. Similar effort has been

carried on in ten other villages further west and in Central Africa. These improvements include the laying out of broad avenues, the planting of shade trees, provision for public gardens, for electric-lighting facilities, for good drinking water and other water, for furnaces for the incineration of waste and for ample cemeteries. The native villages have been entirely rebuilt and at the same time set apart from the European quarters. The work is more difficult where European constructions have been permitted among native buildings or open lands, as at Grand Lahou. For the European population, here exiled to life in the tropics, there is a pressing moral need for cleanliness, comfort and beauty.

No. 342

Housing Construction by the City Architects of Hamburg, Germany.

71.43 (43.516)

The state of Hamburg has recently created in a portion of its area a quite remarkable housing colony. The groups of buildings have been subordinated to a single architectonic conception and an impression of unity is produced by the ensemble which is of great beauty. The present plan provides situations for public buildings to be constructed later—a church and a community house and other structures. After these, the disposition of blocks of houses is determined. Forest-clad reserves cross the colony, forming park-like areas. Houses are not permitted of great height, two stories being the limit. Some are designed for several families, but all are constructed in such a manner that each room is well lighted. Each block of houses is surrounded by gardens and play-places for the children. Worthy of mention is the heating installation, which is very thoroughly studied. Each house has a special arrangement providing the kitchen and an adjoining room with heat.

No. 347

The Working Man's City of Penhonet St. Nazarre, France.

71.34 (44.14)

An important shipbuilding company at Penhonet near St. Nazarre has organized a society for the building of low-priced homes for its employees, and there has now been built upon 5 hectares of ground owned by the company a small village. Provision is made, among other things, for special lodgings for unmarried men, a building with 100 rooms and with all modern comforts and best sanitary conditions. Then for the married employees there are 100 small houses, each with a garden. Each house contains a large kitchen, a dining-room, two or three chambers, and toilet arrangements. The city is provided with a cooperative restaurant, and with a community house containing, among other features, a library. Furthermore, provision is made for a savings bank, for milk distribution and for a mutual aid society as well as for a shop for the distribution, at low prices, of supplies or provisions. Courses in apprenticeship are furnished to the young men.

No. 348

The Evolution of Urban Functions at Caen, France

71.311 (44.22)

Caen belongs in history to the XIth Century: the Normans, struck by the advantage of the site, made of it a fortified port. To its military role, there succeeded an agricultural function, and especially a commercial function. Important works, such as the maritime canal and the St. Pierre Basin, restored the traffic of the port after 1557. There followed the importation of iron and other minerals. The industrial function is more recent. The great metallurgical development, the tall furnaces at Colombelles and Mondeville, and the shipyards have been established since the war. Great urban transformations are now going on, bringing with them a great increase in the population; indeed the over-population of the town is noticeable, and with it an influx of foreign workmen. Belgian, Polish, Kroatian, Spanish, Morroccans and Chinese. Caen is the economic capitol of Lower Normandy.

No. 344

EDITORIAL NOTE.—In the *Tablettes Documentaires Municipales*, the publication of the International Union of Cities from which the foregoing items have been translated by Stephen Child, many other articles of civic interest are briefly reviewed. In the original edition the name of the magazine or report from which each item has been prepared, is shown, together with the date and place of its publication. Readers of THE AMERICAN CITY who desire further information regarding this source of civic documentation can obtain it from Mr. Child at 538 Merchants Exchange Building, San Francisco, Calif.



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Rural Highway Pavements—Maintenance and Reconstruction.—By Wilson G. Harger, Engineer, New York State Department of Highways, McGraw-Hill Book Company, Inc., New York, 1924. XVI + 637 pp. Tables and illustrations. \$6.00.

Mr. Harger has produced a volume which will be particularly helpful to the designing and maintenance engineers in charge of secondary roads. The book deals with each question in a straightforward manner, presenting the advantages and disadvantages of various paving materials, based on experience and on the use to be made of them, and shows the close relationship of theory and practice. "The object of this book is to emphasize and illustrate the application of well-recognized engineering principles, which have been more or less befogged by non-technical propaganda. The method adopted includes development of tentative theories, illustrated by typical reports covering the usual problems. The main value of the volume probably lies in its definite design data, its discussions of the suitability of different pavements, considering maintenance, renewal, and motor vehicle operating costs, and in the selected official reports which apply the general principles of design to specific cases."

Super-Power as an Aid to Progress.—By Guy E. Tripp, Chairman of the Board of Directors, Westinghouse Electric and Manufacturing Co. G. P. Putnam's Sons, New York, 1924. VII + 61 pp. Illustrated. \$1.25.

The author believes that super-power development represents the most important step that can be taken to-day to advance America's progress. Six non-technical articles presenting the social, economic and political aspects of the subject are gathered together in this volume. They are: The Electrification of North America; Private Ownership vs. Government Ownership of Super-Power Systems; What America's Water Power Will Do for American People; Water Power and Statesmanship; States Must Not Isolate Their Water Power; Super-Power as an Aid to National Defense.

Problems of Public Finance.—By Jens P. Jensen, Department of Economics, University of Kansas. In Crowell's Social Science Series, edited by Seba Eldridge, University of Kansas. Thomas Y. Crowell Company, New York, 1924. XVIII + 606 pp. \$3.00.

A text-book in elementary public finance, setting forth the basic principles of state fiscal activities and describing actual experience and organization in this field. The material is presented in four great divisions—public expenditures, revenues, credit and fiscal administration, and assumes the reader's general knowledge of economics. The book is of value, not only to students in the classroom, but to public officials, taxpayers, and social workers.

The Empire Municipal Directory and Year Book.—Published by Municipal Engineering and The Sanitary Record, 8, Breams Buildings, Chancery Lane, London, E. C. 4, England. 337 pp. with diary for year ending March 31, 1925. 11 shillings.

A complete and authoritative list of all the corporations, county, urban, and rural district councils, with their populations, municipal undertakings, names of their administrative officials, etc., in Great Britain, the Colonies and overseas Dominions. The special articles by authorities constitute a review of progress in the past year and a record of present practice on roads, lighting, motor vehicles, water-supply and purification, sewage disposal, health and sanitation, waste disposal, housing and town planning, etc.

The Community and Its High School.—By Paul E. Belting, Ph. D., Assistant Professor of Secondary Education, University of Illinois; with an Introduction by Lotus D. Hoffman, Ph. D., President of the University of Minnesota. D. C. Heath and Company, New York, 1923. XII + 371 pp. \$1.80 postpaid.

This volume shows what the high school should be, and can be, within itself as a democratic community, and in the community, through many contacts with the life of the present and through preparation for the life that the students will live after they leave the school. The school should be aware of all change, and should keep step with all progress. The author describes the important changes in modern social life and shows how the high school can lay hold of the beneficial results of those changes.

Medical and Sanitary Inspection of Schools.—By S. W. Newmayer, A. B., M. D., Supervisor of School Medical Inspection, Philadelphia. Lee & Febiger, Philadelphia. Second edition. 1924. X + 462 pp. Illustrated. \$4.00.

A book for the health officer, the physician, the nurse and the teacher, describing what the author considers the best practice of the day in the various divisions of school health inspection. The seven parts are: Administration; The School Building and Grounds; Communicable Diseases; Physical Defects; The Health of Teachers; Mentality; Allied Subjects of School Medical Supervision. The information and instructions given are detailed and definite, making this a manual for practical, every-day use.

Three Problem Children.—Publication No. 2 of the Joint Committee on Methods of Preventing Delinquency, 50 East 42nd Street, New York, 1924. 146 pp. \$1.00.

A non-technical account of what was done to understand and help three unhappy children. The stories have been prepared from the case records of the Bureau of Children's Guidance, the psychiatric clinic conducted by the New York School of Social Work in its administration of one division of the Commonwealth Fund Program for the Prevention of Delinquency. Setting forth a sympathetic and scientific procedure for the better understanding and guidance of maladjusted children. The cases described are not treated as types, but as individual combinations of physical, mental and social qualities and conditions.

The National Housing Manual.—By Henry R. Aldridge, Secretary, National Housing and Town Planning Council. Published by the Council, 41, Russell Square, London, W. C. 1, England. December, 1923. 526 pp. Illustrated. £2.2.0.

A guide to national housing policy and administration in Great Britain, containing five parts: A History of the Housing Movement; Housing Progress Between the Outbreak of the Great War (1914) and July, 1923; The Preparation and Adoption by the State of a National Housing Policy; The Administration of a National Housing Policy; Housing Progress in Other Countries. The policy presented in Part III shows the application of the thought and discussion of hundreds of earnest and capable men and women at conferences and private meetings of the National Housing and Town Planning Council for a number of years.

Prisons and Common Sense.—By Thomas Mott Osborne, A. B., L. H. D., Warden of Sing Sing (N. Y.), Prison, 1915-'16. J. B. Lippincott Company, Philadelphia. 1924. 105 pp. \$1.25.

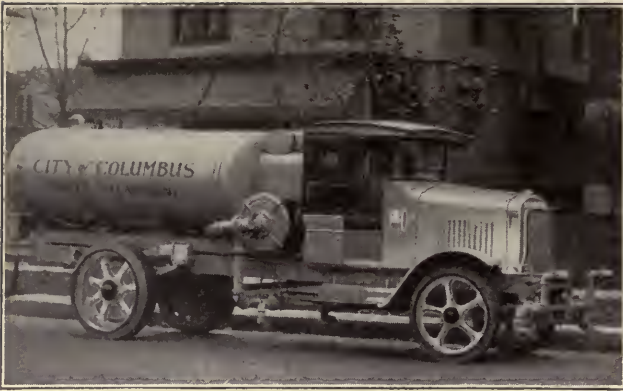
Two articles—"A Sure Foundation," and "The Mutual Welfare League"—the first published in the Atlantic Monthly and the second read before the American Prison Association in 1923. Presenting an appeal for public understanding of prison conditions and problems and for a sense of responsibility for the rational conduct of penal institutions, and telling what the Mutual Welfare League has accomplished at Auburn, Sing Sing, and the Portsmouth Naval Prison. A volume of facts that Mr. Osborne knows, and of principles that he believes we should all be responsible for.

Immigration: Select Documents and Case Records.—By Edith Abbott, Dean of the Graduate School of Social Service Administration in The University of Chicago. The University of Chicago Press, Chicago. 1924. XXII + 809 pp. \$4.50.

This is the first of a series of source books and treatises in the field of social science, designed to provide hitherto unavailable material for the use of students of social service administration. The records in this volume cover the last ten years and are taken from the files of the Immigrants' Protective League of Chicago, and the Immigrants' Commission of Illinois.

Building Strong Bodies.—By Woods Hutchinson, M.D. Houghton Mifflin Company, Boston, 1924. V + 254 pp. Many illustrations. 88 cents postpaid.

A text-book for elementary schools, written in the author's well-known practical, invigorating style. It appeals to the intelligence of its young users in explaining why and how their bodies should be cared for and strengthened, and it shows how to use all the means and methods of outdoor recreation to the best advantage.



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Camping Out.—Edited by L. H. Weir, Field Secretary, Playground and Recreation Association of America. The Macmillan Company, New York. 1924. XX + 626 pp. Illustrated. \$2.00.

A manual on organized camping, based on a study of summer camps during 1923, and designed for the use of those conducting such camps or training-camp directors and leaders. Practical and up-to-date detailed information on the various divisions of the subjects, prepared by experts. The chapters are: Camping in the United States; Selection of Camp Site; Camp Site Planning; Equipment; Camp Committee Organizations and Duties; Camp Organization; Bases of Program Making; Camp Sanitation; Diet and Nutrition; Accounting for Camps; Leadership; The Training of Camp Leaders; Camp Standards.

The City Managers' Association.—Tenth Yearbook. April 1, 1924. 231 pp. Containing the history of the growth, development and success of the city manager plan. There are seven articles on city administration by city managers in Canada, New Zealand, and the United States. The proceedings of the tenth annual convention of city managers held in Washington, D. C., November 7, 1923, are also included, and a directory of city manager cities, their managers, and salaries paid as of March 15, 1924. 50 cents. (Apply to John G. Stutz, Executive Manager, The City Managers' Association, Lawrence, Kans.)

Current Facts on City School Costs.—In the January and March, 1924, issue of the Research Bulletin of the National Education Association. 64 pp. Giving for the last school year data whereby the per-pupil cost of the schools in cities of all sizes may be compared; containing illustrative material showing how the facts on school costs may be presented to the taxpayer, also a bibliography on school accounting and budgeting. The chapters are: Facing the Facts of School Costs; Why Have City School Costs Increased; Increased Costs Analyzed in a City; Facts About Teachers' Salaries; Who Should Control City School Expenditures; School Financial Accounting and Budgeting; Facts on City School Finance in 1923. (Apply to the Research Division of the National Education Association, 1201 Sixteenth Street Northwest, Washington, D. C.)

City Tax Rate Bulletin for 1923.—Compilation of the city, school and county tax rates effective for 543 cities in Kansas, together with their population, assessed valuation and bonded indebtedness. Prepared by the Municipal Reference Bureau, University Extension Division, University of Kansas, Lawrence, Kans. Bulletin No. 46, April 1, 1924. 29 pp. 50 cents. (Apply to the Bureau.)

Houston Recreation and Community Service Department and Association.—Annual Report and Pageant—1923. A short story in pageant form of the services rendered during the year 1923 to the people of the city of Houston, Tex., by the Recreation Department and Association. 17 pp. Illustrated. (Apply to Corinne Fonde, Executive Secretary of Association and Commission.)

Selected Pictures 1923-1924.—Ninth Annual Catalog of the National Committee for Better Films. Contains list of 532 motion pictures selected by The National Board of Review of Motion Pictures from pictures submitted to it, in advance of release, during 1923. 31 pp. 25 cents. (Apply to the National Committee, 70 Fifth Avenue, New York, N. Y.)

New Jersey Finances.—First and second installments of a study of taxation and public expenditures in New Jersey, under the titles of State Finances, and Inequalities in Assessments. Prepared by Paul Studensky, Director of the Bureau of State Research of the New Jersey State Chamber of Commerce, 20 Clinton Street, Newark, N. J. 12 and 4 pp. respectively, in the March, 1924, issue of the State Research section of "New Jersey." Charts and tables. (Apply to the Bureau.)

The Committee of Fourteen, New York City.—Annual Report for 1923. 44 pp. Including the proposed amendment to the Vagrancy-Prostitution Law. (Apply to the Secretary of the Committee, Frederick H. Whitin, 27 East 22nd Street, New York, N. Y.)

Modern Street Lighting.—Preliminary report by the Committee on Street Lighting of the Columbus Chamber of Commerce, Columbus, Ohio, including illustrations, data, and descriptions of exhibits. March, 1924. 40 pp. Covering the special exhibit of street-lighting products made by electric manufacturing companies on the streets of Columbus. (Apply to M. S. Hopkins, Consulting Engineer, Chamber of Commerce, Columbus, Ohio.)

Municipal Finance and Improvement Policies.—By H. G. McGee, Director, Municipal Research Bureau, Chamber of Commerce, Akron, Ohio, in the February 7, 1924, issue of Engineering News-Record. 3 pp. A study of expenditures and receipts of cities of 30,000 and upwards, 1903 to 1921, with suggestions as to a policy to govern capital outlays for improvements. (Apply to Engineering News-Record, Tenth Avenue and 36th Street, New York, N. Y.)

National Health Series.—Second unit in the twenty-volume series. Five pocket-size books with flexible covers: The Quest for Health—Where It is and Who Can Help Secure It, by James A. Tobey, Administrative Secretary, National Health Council, 63 pp.; Taking Care of Your Heart, by T. Stuart Hart, A. M., M. D., President, Association for the Prevention and Relief of Heart Disease, 72 pp.; The Human Machine—How Your Body Functions, by William H. Howell, Ph. D., M. D., LL. D., Sc. D., School of Hygiene and Public Health, Johns Hopkins University, 75 pp.; The Young Child's Health, by Henry L. K. Shaw, M. D., Clinical Professor of Diseases of Children, Albany Medical College, New York, 56 pp.; Food for Health's Sake—What to Eat, by Lucy H. Gillett, A. M., Superintendent, Nutrition Bureau, New York Association for Improving the Condition of the Poor, 47 pp. 1924. 30 cents each. Apply to Funk & Wagnalls Company, New York, N. Y.)

Methods of Administering Iodine for Prophylaxis of Endemic Goiter.—By Robert Olesen, Surgeon, United States Public Health Service. Reprint No. 893 from the Public Health Reports, January 11, 1924. The merits of, and objections to, the prevailing methods of iodine administration are pointed out incidentally, the most favored one being the administration, to school children between the ages of 11 and 16, of a chocolate tablet containing 10 milligrams of iodine in the form of an organic acid. 5 cents. (Apply to the Government Printing Office, Washington, D. C.)

The Victrola in Physical Education, Recreation and Play.—Issued by the Educational Department, Victor Talking Machine Company, Camden, N. J. 68 pp. Illustrated. Listing and describing Victor records suited to folk dancing, gymnastics, health exercises, etc., with brief descriptions of the dances of various countries. (Apply to the publishers.)

The Local Government News.—Published by The Fabian Society in conjunction with the Labour Party. A new 8-page monthly, edited by William A. Robson, B.Sc. (Econ.), Barrister-at-Law. 1d. per copy, 1 shilling yearly for ten issues (August and September omitted). (Address the publication at 25 Tothill Street, Westminster, London, S. W. 1, England.)

Municipal Record, Auckland, New Zealand.—Volume 1, No. 1, of the official organ of the Auckland City Council. March 15, 1924. 24 quarto pp. Illustrated. To be published quarterly as a means of promoting more wide-spread civic pride in Auckland. (Apply to the City Council.)

Boston, Mass.—Annual Report of the Public Works Department for year ending January 31, 1924. (Apply to Joseph A. Rourke, Commissioner of Public Works.)

Los Angeles, Calif.—Annual Message of the Mayor. January 2, 1924. (Apply to George E. Cryer, Mayor.)

Los Angeles, Calif.—Fourteenth Annual Report of the Board of Public Utilities for year ending June 30, 1923. (Apply to F. A. Lorentz, Chief Engineer of the Board.)

New Orleans, La.—Twenty-seventh Report of the Board of Commissioners of the Port of New Orleans, as of August 31, 1923. (Apply to J. H. Walsh, General Manager of the Board.)

New York, N. Y.—Report of the Chief Engineer of the Board of Estimate and Apportionment for 1922. (Apply to Arthur S. Tuttle, Chief Engineer.)

Oak Park, Ill.—Twenty-second Annual Report of the Department of Public Works, for 1923. (Apply to Dudley C. Meyers, Commissioner of Public Works.)

Richmond, Va.—Annual Report of the Director of Public Works for 1923. (Apply to Allen J. Saville, Director of Public Works.)

South Bend, Ind.—Annual Reports of Departments for 1923. (Apply to Eli F. Seebirt, Mayor.)

Spokane, Wash.—Annual Report of City Auditor for 1923. (Apply to A. W. Burch, City Auditor.)

Springfield, Mass.—Fiftieth Annual Report of the Board of Water Commissioners, for 1923. (Apply to Howard M. King, Superintendent of Water-Works.)

Westmount, Que.—Annual Reports for year ending October 31, 1923. (Apply to P. W. McLagan, Mayor.)



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The Problem of Street Traffic in a Modern City.—By Henry M. Brinckerhoff. Including the following: What the Tall Building and the Elevator Mean to a City; How Large Cities Handle Downtown Congestion; Rapid Transit by Private Automobile; City Development and Transportation Are Inseparably Connected. Reprint of a series of four articles from "Finance and Industry." (Apply to Parsons, Klapp, Brinckerhoff & Douglas, 84 Pine Street, New York, N. Y.)

City Home Rule Law Makes Sweeping Changes.—Provisions of the bill which the New York Legislature passed to carry out the terms of the home rule amendment to the state constitution, which was adopted by the voters at the last election. Statement prepared by the Legislative Service Bureau of The Merchants' Association of New York, in "Greater New York" for May 5, 1924. (Apply to The Merchants' Association of New York, 233 Broadway, New York, N. Y.)

On the Calendar of Conventions

JUNE 8-10.—STEVENS POINT, WIS.

Wisconsin Association of Commercial Secretaries. Annual convention. Secretary, Lee I. Yorkson, Chamber of Commerce, Wausau, Wis.

JUNE 9-10.—BUFFALO, N. Y.

New York State Commission of Housing and Regional Planning. First State Conference on Regional and City Planning. Chairman, Clarence S. Stein, 949 Broadway, New York, N. Y.

JUNE 9-14.—DETROIT, MICH.

National Assembly of Civil Service Commissions. Annual meeting. Secretary, Charles S. Shaughnessy, Civil Service Commission, Philadelphia, Pa.

JUNE 10-12.—KENSINGTON, PA.

Pennsylvania State Association of Boroughs. Annual convention. Secretary, J. Herman Knisely, Capitol Building, Harrisburg, Pa.

JUNE 11-13.—SPARTANBURG, S. C.

Southern Commercial Secretaries' Association. Annual convention. Secretary, L. P. Dickie, Chamber of Commerce, Tampa, Fla.

JUNE 11-14.—SAN FRANCISCO, CALIF.

American Association of Engineers. Annual convention. Secretary, C. E. Drayer, 68 East Adams Street, Chicago, Ill.

JUNE 13-14.—SWAMPSCOTT, MASS.

New England Association of Commercial Executives. Annual meeting. Secretary-Treasurer, George F. Wells, Chamber of Commerce, Lowell, Mass.

JUNE 13-14.—MIDDLETOWN, OHIO.

Ohio Commercial Secretaries' Association. Annual meeting. Secretary, Avery G. Clinger, Secretary-Treasurer, Chamber of Commerce, Columbus, Ohio.

JUNE 16-20.—DETROIT, MICH.

National Organization for Public Health Nursing. Biennial convention. General Director, Anne A. Stevens, 370 Seventh Avenue, New York, N. Y.

JUNE 17-19.—PROVIDENCE, R. I.

National Association of Comptrollers and Accounting Officers. Annual convention. Secretary, Mark M. Foote, Comptroller's Office, Chicago, Ill.

JUNE 19-20.—DETROIT, MINN.

League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, The Municipal Reference Bureau, University of Minnesota, Minneapolis, Minn.

JUNE 20-21.—INDIANAPOLIS, IND.

Indiana Commercial Secretaries Association. Annual meeting. Secretary, W. H. Arnett, Chamber of Commerce, Kokomo, Ind.

JUNE 23-25.—TORONTO, ONT.

International Association of Police Women. Annual conference. Secretary, Mrs. Mabel Rockwell, Police Department, Chicago, Ill.

JUNE 23-27.—CHICAGO, ILL.

American Institute of Electrical Engineers. Annual convention. Secretary, F. L. Hutchinson, 33 West 39th Street, New York, N. Y.

JUNE 23-29.—TORONTO, ONT.

National Probation Association. Annual conference. General Secretary, Charles L. Chute, 370 Seventh Avenue, New York, N. Y.

JUNE 24-26.—BOSTON, MASS.

New England Association of Fire Chiefs. Annual convention. Secretary, Chief John W. O'Hearn, Watertown, Mass.

JUNE 24-27.—NEW BRUNSWICK, CANADA

Canadian Good Roads Association. Annual convention. Secretary, George A. McNamee, 909 New Birks Building, Montreal, Que.

JUNE 25-JULY 2.—TORONTO, ONT.

American Association for Community Organization. Annual meeting. Secretary, Pierce Williams, National Information Bureau, 1 Madison Avenue, New York, N. Y.

JUNE 25-JULY 2.—TORONTO, ONT.

National Conference of Social Work. Annual meeting. Secretary, William H. Parker, 25 East 9th Street, Cincinnati, Ohio.

JUNE 27-JULY 5.—WASHINGTON, D. C.

National Education Association of the United States. Conference on Thrift and Education, June 27-28; annual sessions of N. E. A., June 29-July 5. Secretary, J. W. Crabtree, 1201 Sixteenth Street, N. W., Washington, D. C.

JUNE 30-JULY 5.—SARATOGA SPRINGS, N. Y.

American Library Association. Annual meeting. Executive Secretary, Carl H. Milam, 78 East Washington Street, Chicago, Ill.

JULY 2-9.—AMSTERDAM, HOLLAND.

International Town Planning Conference. Address: Organizing Secretary, International Garden Cities & Town Planning Federation, 3, Gray's Inn Place, London, W. C. 1, England.

JULY 14-18.—MONTREAL, CANADA.

International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

JULY 14-26.—EVANSTON, ILL.

National School for Commercial and Trade Executives. Address: Robert B. Beach, Business Manager, Chicago Association of Commerce, Chicago, Ill.

JULY 20-26.—PALO ALTO, CALIF.

Western School for Commercial Organization Executives. Annual convention. Address: Professor Edwin A. Cottrell, Stanford University, Palo Alto, Calif. *California Association of Commercial Secretaries.* Secretary-Treasurer, A. M. Robertson, Oxnard, Calif.

AUGUST 15-22.—SALT LAKE CITY, UTAH.

American Prison Association. Annual congress. General Secretary, E. R. Cass, 135 East 15th Street, New York, N. Y.

AUGUST 19-21.—MASON CITY, IOWA.

League of Iowa Municipalities. Annual meeting. Secretary, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 19-22.—BUFFALO, N. Y.

International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

AUGUST 23-24.—MONCTON, NEW BRUNSWICK.

Union of New Brunswick Municipalities. Annual convention. Secretary, James King Kelley, 108 Prince William Street, St. John, N. B.

SEPTEMBER 23-25.—MONTREAL, CANADA.

The City Managers' Association. Annual convention (international). Executive Secretary, John G. Stutz, Lawrence, Kans.

SEPTEMBER 23-26.—ROCHESTER, N. Y.

New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 29-OCTOBER 3.—BOSTON, MASS.

American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, St. Petersburg, Fla.

OCTOBER 8-10.—EMPORIA, KANS.

League of Kansas Municipalities. Annual convention. Secretary-Treasurer, John G. Stutz, Lawrence, Kans.

OCTOBER 20-22.—WASHINGTON, D. C.

National Association of Commercial Organization Secretaries. Annual meeting. Secretary-Treasurer, Raymond B. Gibbs, Chamber of Commerce, Kansas City, Kans.

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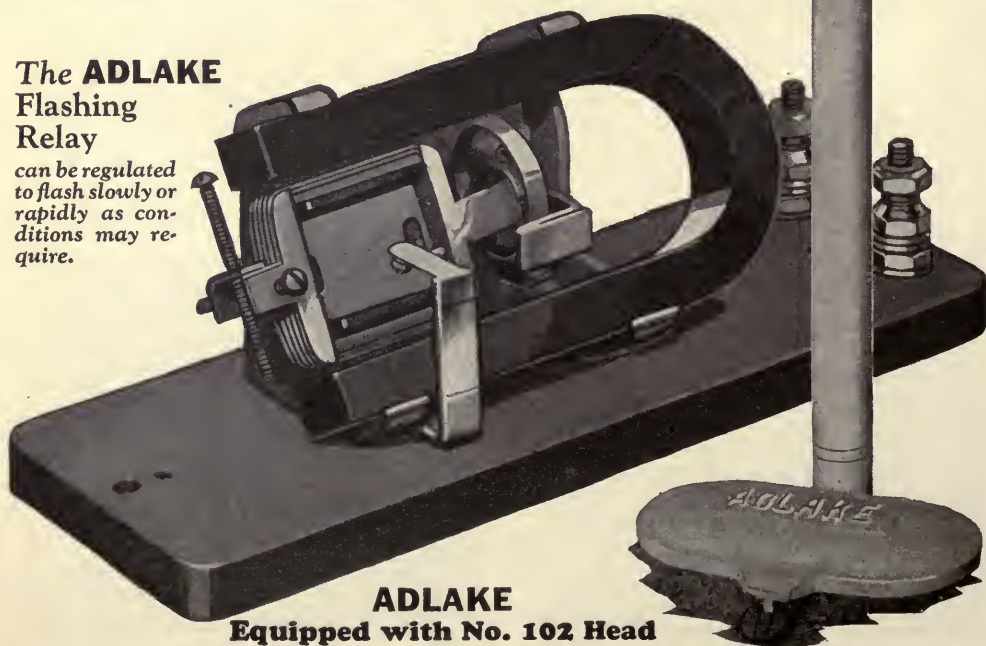
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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

New Quarters for Pittsburgh Testing Laboratory

The Pittsburgh Testing Laboratory has moved to its new laboratories and office building located on Stevenson Street at Locust, Pittsburgh, Pa. The building is a five-story, brick-concrete structure, well lighted and ventilated, so that all determinations can be accurately performed. The laboratories are equipped with all improved types of physical testing machines and chemical apparatus. Physical officials are invited to inspect these new quarters at any time.

New Detroit Branch Manager

Industrial Works, Bay City, Mich., has announced that Fred J. Mershon, who for many years has been Export Sales Manager of the company, has now taken entire charge of the Detroit branch office located in the Book Building, Detroit, Mich.

Improvements in Ditching Machines

Improvements in the ditching machine made by the Barber-Greene Company, Aurora, Ill., are said to make the new model 44-A twice as effective as previous models. The basic design of the machine has not been changed, but the crawler has been lengthened 3 inches, the engine is mounted so as to better counterbalance the boom, the control and drive shaft have been simplified, changes in digging speeds are now made by shifting gears

as in an automobile, and the digging depth has been increased to 5½ feet.

The vertical boom with which all Barber-Greene ditchers were originally equipped has been retained. It has been made more efficient by a re-design of the bucket. The original bucket was self-cleaning, but the new type is deeper and the cleaning lip has been given a greater swing. Sides have been added to the bucket, and the projection of the teeth has been extended. Another feature is the interlocking arrangement of the bucket whereby in the digging position the buckets rest upon one another so that the digging pressure is distributed along the whole bucket line as in a column, preventing the bucket line from doubling in. Complete protection against wreckage of the digging boom is given by the overload release sprocket, which does away with any friction clutch or breaking bolt safety devices. The sprocket prevents loss of time, as it slips when any overload is placed on the boom, turning immediately to operating position again and slipping again if the overload is still present. This action may be continued practically indefinitely until the stone, pipe, or other obstruction is dislodged or until the operator concludes that it is necessary to pass the boom over the obstruction and dig it out by hand.

The machine is equipped with a new crawler which is 3 inches longer and on which the weight of the machine is better distributed. This distribution has been obtained by mounting the motor



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just outside of the frame, instead of just inside, as formerly. The crawler frame is of a one-piece steel casting. By mounting the motor outside, it has also been possible to eliminate one counter-shaft and thus simplify the transmission of power to the various parts. A 38-horsepower engine provides ample power for any digging.

St. Petersburg Extends White Way Lighting

Several years ago public-spirited citizens and merchants decided that the street-lighting system of St. Petersburg, Fla., should be improved. B. M. Latham, manager of the local lighting company, succeeded in floating and disposing of a bond issue to obtain the necessary funds for the initial installation, which consisted of approximately 100 Elreco combination railway and lighting poles made by the Electric Railway Equipment Company, Cincinnati, Ohio.

As the city continued to grow, there was constant agitation for the extension of the initial installation, with the result that in December, 1922, an order for 66 additional combination railway and lighting poles and General Electric Form 9 Novalux units was placed with the manufacturers. Not satisfied with this extension for Ninth Street, the more enterprising citizens, in conjunction with the larger real estate companies, inaugurated a movement to extend the Central Avenue system, which was then about a mile long, to cover the entire length of the street, which is approximately 7 miles long and 100 feet wide. One end of this street, which is Central Avenue, terminates at old Tampa Bay, and the other end terminates at the extreme western end of Central Avenue, which is Boca-Ceiga Bay, in the arm of the Gulf of Mexico.

The Mears-Wright Electric Company of St. Petersburg, Fla., were the successful bidders for the last equipment and installation, the contract being awarded on March 6. The order for material calls for 740 Elreco tubular steel poles, ornamental lighting brackets and other fittings. General Electric Form 8 Novalux units with dome refractors will be used, each unit to be fed through an individual low-voltage I.L. transformer, which effectively does away with the necessity of using high-voltage wires in the steel poles. R. E. Ludwig, Director of Public Utilities, is to be responsible for the installation, which necessarily must conform to the city standards, as the current for lighting the entire system will be furnished by the city of St. Petersburg, which now owns its electric plant. The original purchase of the equipment was financed by the merchants and the abutting property owners.

New Pittsburgh Office for Sullivan

The Pittsburgh office of the Sullivan Machinery Company, 122 South Michigan Avenue, Chicago, Ill., which has been for many years on the fifteenth floor of the Farmers Bank Building, Pittsburgh, Pa., has been moved to larger space in rooms 517-520 in the same building. The additional space will greatly facilitate the handling of the company's business in Pittsburgh, which has grown consistently for a number of years. Warehouse space for large stocks of air compressors and their parts, as well as other Sullivan equipment, is pro-

vided at Pittsburgh Terminal Warehouse, South Side, and enables prompt service to be given customers in Western Pennsylvania, Ohio, and Northern West Virginia. William R. Jarvis has been the manager at Pittsburgh since 1904.

Ward Street Sewage Pumping-Station, Boston

A 78-inch Morris centrifugal pump having a capacity of 50,000,000 gallons per day against a 45-foot lift at 150 to 160 revolutions per minute, has been installed in the Ward Street sewage pumping-station, Boston, Mass., under the direction of Frederick D. Smith, Chief Engineer of the Metropolitan District Commission. This pump will be driven by a Nordberg Uniflow single-cylinder engine made by the Nordberg Manufacturing Company, Milwaukee, Wis.

There are also two large vertical, triple-expansion engines which drive reciprocating pumps having 48-inch plungers and a 60-inch stroke, and having contract capacities of 50,000,000 gallons per day each, against a 45-foot lift, installed in this station.

Neil Now at New York Office of Dorr Company

The Dorr Company, 247 Park Avenue, New York City, has announced that W. A. Neill, head of the Mechanical Engineering Department of the company, will be located at the executive offices of the company in New York City after June 15.

New Chicago Manager of Gamon

J. G. Smyser, who has represented the Gamon Meter Company, of Newark, N. J., for some time, has been made manager of the Chicago office of the company, which is located at 360 North Michigan Avenue.

New Company to Make Chlorine Control Apparatus

Richard V. Donnelly, who recently resigned as Manager of Sanitary Sales for the Wallace & Tiernan Company, Inc., Howard Pardee, formerly Assistant Manager for the same company, and S. Pincus, for 7½ years Sanitary Engineer with the U. S. Public Health Service, have organized the Paradon Engineering Company, Long Island City, N. Y., for the manufacture and sale of chlorine control apparatus for water purification and sterilization of sewage.

A Correction

The lower illustration on page 515 of the May, 1924, issue of THE AMERICAN CITY picturing the school bus used by the Sanger Union High School, Sanger, Calif., shows a bus mounted on a Pierce-Arrow chassis.

Newark Fire Chief Now with Foamite-Childs

After 32 years' service in the Fire Department at Newark, N. J., in which he has filled, by permanent appointment, every grade in the fire-fighting service, Chief Paul J. Moore retired on June 1 to become associated with the Foamite-Childs Corporation, Utica, N. Y., as a special representative in the Motor Fire Apparatus Department.

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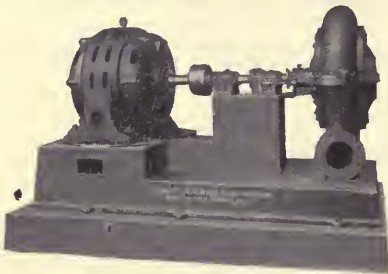


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